

SEPTEMBER 1954

NLGI

Spokesman

Journal of National Lubricating Grease Institute



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New Grease Thickener... Estersil GT

by Du Pont

A new type of grease thickener—quite different from any previously used in commercial grease production—was recently announced by the Petroleum Chemicals Division of the Du Pont Company.

The new material, an estersil, is a pelletized form of finely divided amorphous silica with a "raincoat" chemically attached to each tiny ultimate particle.

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5. **Superior Handling Qualities**—Softer, more easily applied greases

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6. **Ease of Manufacture**—The completely synthetic preformed thickening structure allows reproducible grease preparation through a simple milling operation.

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President's page

by G. A. OLSEN, President, NLGI

In Anybody's Language



Room reservations already made at the Mark Hopkins and Huntington Hotels in San Francisco indicate the San Francisco meeting of the National Lubricating Grease Institute will be International in character, again confirming that lubricating grease is a most interesting subject in anybody's language (see page 20).

This issue of the **Spokesman** displays quotations from various countries indicating a continuing mutual interest in lubricating grease technology—the first petroleum product man devised for his benefit and use—and which today continues to contribute to and make possible the operation of vast mechanical mechanisms for the benefit of society the world over.

Mechanical improvements have created new problems for our industry which it has always solved and thereby assisted in man's march of progress.

With world-wide interest in lubricating grease technology, its manufacture and application, might it not be possible that our San Francisco Institute would further world-wide good will and cooperation?

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ABOUT THE COVER

Going through the *Spokesman* mailing list recently we came across subscribers in 34 countries outside the United States. Look on page 20 and you'll see copies of articles and abstracts appearing in six foreign publications. This gave our artist, Ronald Jones, an idea and he came up with a drawing of the *Spokesman* wrapped around the world.

Lubricating Grease Research On the West Coast

The material on the following twelve pages will give you a good idea of the research activities you can see on the West Coast while attending the NLGI Annual Meeting.

It was gathered and coordinated by C. J. Boner of the Battenfeld Grease and Oil Corporation.

Since the National Lubricating Grease Institute holds its Annual Meeting in California this fall, it seems opportune to pay tribute to the groups in that section of the country who have in the past and now are contributing to the knowledge and improvement of lubricating greases.

The material which is to follow does not pretend to be complete but is assembled from information furnished by the companies and institutions mentioned. If others have been overlooked it is because information was not received in time for use. If something is lacking concerning those who have been kind enough to help with information, it is probably because some organizations were reticent about boasting.

Location of Research Groups

The Research Groups can be divided into those located in the San Francisco Bay area and those located in the Los Angeles area. Inasmuch as our meeting will be held in the former location, information will be given about the northern groups first.

Types of Groups in the San Francisco Area

Research on lubricating greases in this area seems to be almost entirely confined to laboratories connected with the petroleum industry. Some information will therefore be given about each company group.

However, a note should be made of the past contribution of universities to such investigations. Probably the best example is the work of the late Dr. J. W. McBain, Professor at Stanford for many years. Dr. McBain was a world authority on soaps and soap systems and in connection with studies of this nature contributed much of value to investigators in our field. Further contributions took the form of consulting work and of training men who have carried on similar studies, both under his direction and at other points.

The assistance of the University of California at Berkeley in helping to prepare certain microphotographs of lubricating greases has been acknowledged.



This is the front view of the main laboratory of the California Research Corporation located at Richmond, California. (Photo courtesy California Research Corporation)

California Research Corporation Richmond, California

General Research Program

The main objective of the group working in the field of lubricating greases is the development of greases for sale by Standard Oil Company of California and its subsidiaries to all of the principal consumer groups—automotive, industrial, aviation, and marine. These subsidiaries include Standard Oil Company of British Columbia, Standard Oil Company of Texas, The California Company, and The California Oil Company. An additional responsibility of this group is to provide technical service to the parent company and its subsidiaries on the production and utilization of lubricating greases.

Based on the widespread appearances of multipurpose greases throughout this country, it is clear that most, if not all, producers and manufacturers of lubricating greases are aiming towards the same goal—a truly all-purpose grease. Standard Oil Company of California is no exception to this trend. The attainment of this goal may be impossible when all aspects, including the economics, are considered. It is probable, therefore, that a multipurpose grease in a minimum of grades is the most practical answer for the near future. Standard Oil Company of California markets such a grease and it has earned a wide acceptability for most operations in the automotive, industrial and marine fields.

The development of a new or improved grease goes through several steps. A search is made for thickeners with the desired characteristics, which may include such properties as water insolubility, high melting point, and inertness as an oxidation catalyst. This search is made on the test tube scale, thereby permitting the screening of

many compounds in a relatively short time. Greases are prepared from these materials and are examined in simple tests, such as boiling water, and hot plate. The more promising of these greases are then prepared in pilot-plant-scale batches of about 50 pounds by techniques applicable to a full-scale grease plant. For the most promising greases, where conventional techniques are inadequate, new methods of manufacture are also investigated. The resultant greases are then subjected to laboratory machine tests and, if successful, to field tests. For the latter stage, the greases are manufactured in full-scale plant equipment, and therefore, are typical of the product that could be marketed if desired.

As a background for all of this work, studies are also made of the behavior of greases in general—flow properties, fiber structure and strength, possible phase changes, work stability, etc., and the effect on these characteristics of temperature, storage conditions, and other variables. This general background knowledge can then be applied at any point in the development program whenever and wherever needed.

Laboratory Facilities

Our facilities, other than those common to any chemical laboratory, include small pilot mixers which are illustrated in the article by R. T. Macdonald and J. L. Dreher, entitled, "Additives for Lubricating Greases," which appeared in the April 1953 issue of *NLGI Spokesman*. High pressure steam, electricity, and gas are utilized as sources of heating. By these means a wide range of op-

erating temperatures is available. Laboratory colloid mills of the stator-rotor type are used during the final stages of the preparation of experimental greases. It has been found that the production of experimental greases on the 35-50 pound scale is practical and that enough grease is produced for many laboratory tests, with a minimum of effort and materials.

Several laboratory bench test machines are used for the evaluation of grease, the majority of which are designed around specific mechanical elements, such as wheel bearings, automobile chassis shackles, the roller from a track-laying tractor, and high speed ball bearings. The test machines in many cases are capable of being operated over wide ranges of load, temperature, and speed, thereby simulating many types of full-scale, commercial operation. These special test machines are supplemented by the Timken Tester, the ASTM Wheel Bearing Tester, the Navy High Speed Bearing, and similar test machines. As auxiliaries to these facilities which are directly concerned with grease studies, there are the very complete services of our analytical and spectrochemical groups which are equipped with modern tools such as the electron microscope, X-ray diffraction and X-ray fluorescence equipment, mass spectrometers, emission spectrograph, ultraviolet and infrared absorption apparatus, together with the means of using radioactive tracer techniques.

The final proof of an experimental grease proposed for marketing is its performance in actual service. The importance of field testing, therefore, cannot be overemphasized.

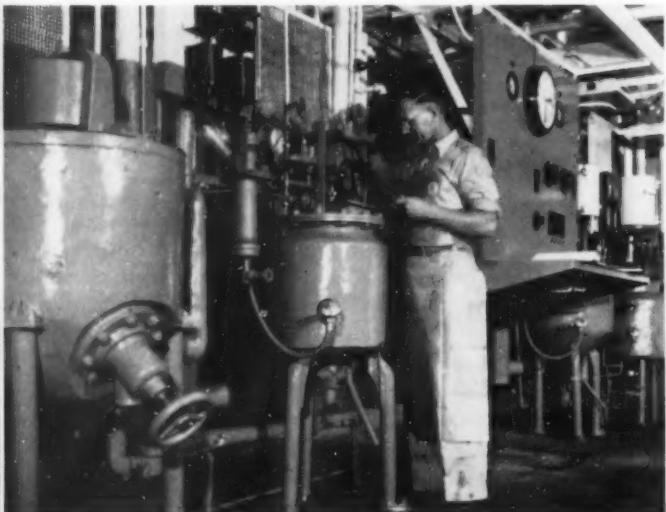
Publications

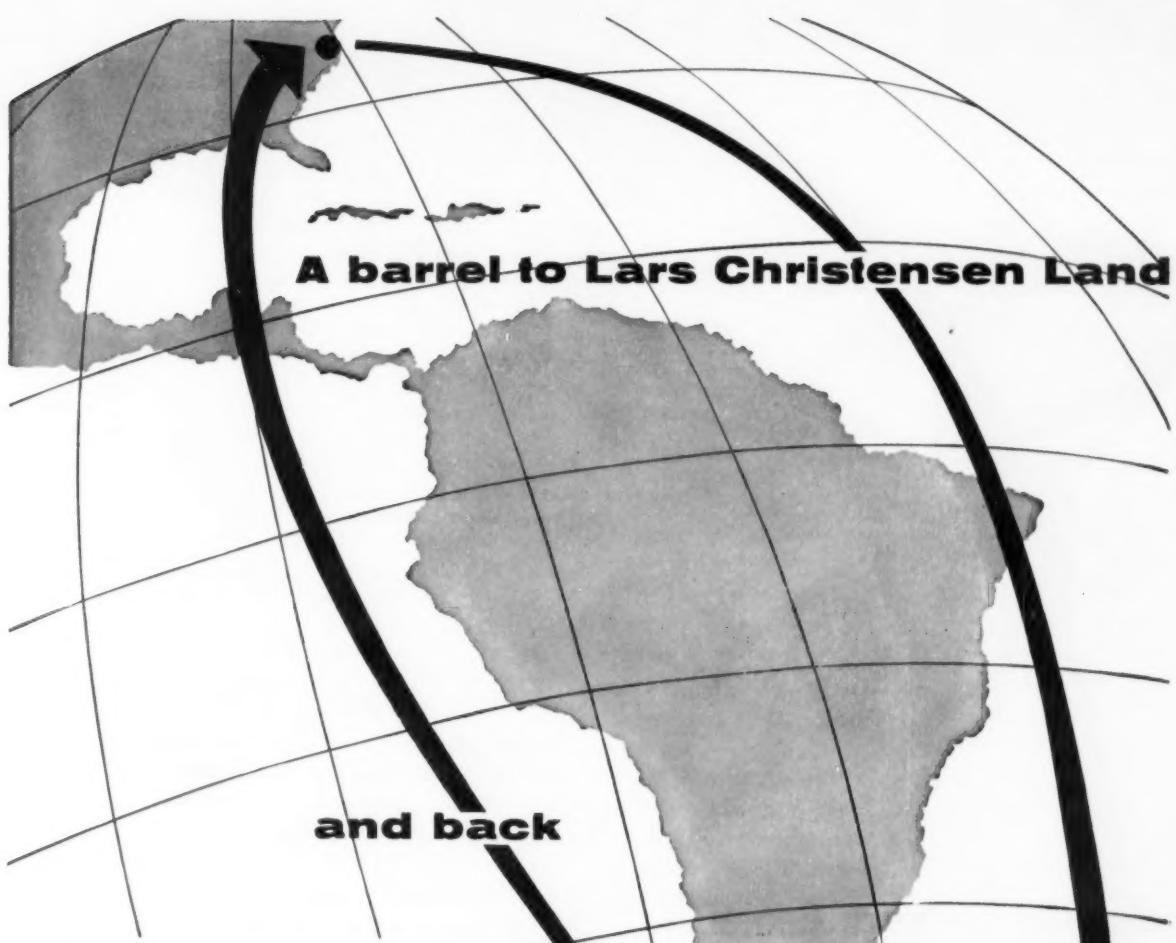
The following publications in the lubricating grease field have originated in our Richmond Laboratory:

1. Farrington, B. B., and Davis, W. N., Ind. Eng. Chem. 28, 414 (1936). "Structure of Lubricating Greases."
2. Farrington, B. B., and Humphreys, R. L., Ind. Eng. Chem. 31, 230 (1939). "Effect of Pressure on Lubricating Greases."
3. Farrington, B. B., and Birdsall, D. H., Oil Gas J. 45, No. 46, 268 (1947, March 22). "Study of Lubricating Greases by Electron Microscope."
4. Hotten, B. W., and Kibler, G. M., Anal. Chem. 22, 1574 (1950). "Improved Miniature Penetrometer Cones for Determination of Lubricating Grease Consistency."
5. Farrington, B. B., Ann. N. Y. Acad. Sci. 53, 979 (1951). "The Fine Structure of Lubricating Greases."
6. Birdsall, D. H., and Hotten, B. W., Anal. Chem. 24, 892 (1952). "Tapered-Hole Disk Penetrometer for Determining Consistency of Semifluid Greases."
7. Hotten, B. W., and Birdsall, D. H., J. Colloid Sci. 7, 284 (1952). "Fine Structure and Rheological Properties of Lithium Soap-Oil Dispersions."
8. Hotten, B. W., Lubricating Engineering 8, 244 (1952). "Fundamental Knowledge of Lubricating Grease Structure."
9. Hotten, B. W., and Farrington, B. B., ASTM Bull. No. 189, 53 (1953). "Thixotropy of Lubricating Greases," (ASTM Technical Committee G-IV work.)
10. Macdonald, R. T., and Dreher, J. L., NLGI Inst. Spokesman 17, (1) 16 (1953). "Additives for Lubricating Greases."
11. Stokely, J. M., and Macdonald, R. T., NLGI Spokesman, 17, (10) 20 (1954). "Grease Characteristics that Significantly Affect Dispensing."



Pictured at upper left is Adrian C. West measuring the frictional properties of a grease. At bottom left is Ernie T. Hofve adjusting a bearing in the Navy High-Speed Bearing Tester. At lower right Lloyd Dickey is shown as he inspects an experimental grease in the course of preparation. (Photos courtesy California Research Corporation)





A barrel to Lars Christensen Land

and back

Unless the penguin and the seal of Lars Christensen Land suddenly become avid users of petroleum products, no one much cares about getting oil to that desolate Antarctic land.

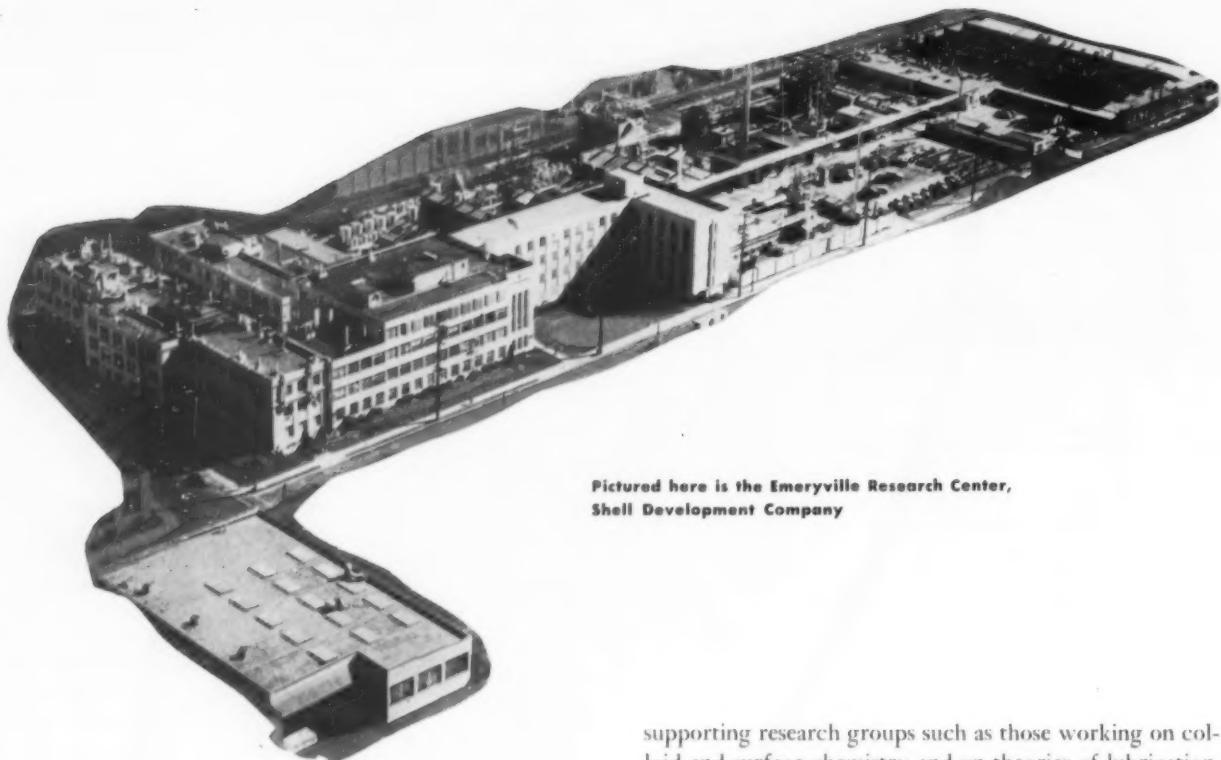
But the round trip from New York to that ice-capped territory is over 21,000 miles . . . and if every barrel of crude oil that Cities Service piped through its own lines in one year were laid end to end, they would make that round trip with many barrels to spare.

Besides transporting millions of barrels of crude through its own lines, Cities Service moved over three hundred million barrels through the pipelines of associated companies.

This pipeline transportation represents just one method of moving vital petroleum products to eager users all over the United States . . . one link in the strong chain that is the backbone of our country's vital defense effort. Cities Service is proud of the part it plays in keeping America strong...and it's this strength that will keep America free.



Quality Petroleum Products



Pictured here is the Emeryville Research Center,
Shell Development Company

Emeryville Research Center Shell Development Company

Emeryville, California

One of the major industrial research organizations west of the Rockies is the Emeryville Research Center of the Shell Development Company having some 1200 employees. This is the largest of several research laboratories maintained by the Shell organization in this country and is predominantly concerned with fundamental and long-range studies on processes and products for Shell Oil Company and Shell Chemical Corporation. Here amongst their other activities is centered long-range research in grease lubrication, a field in which Shell has been active for many years and is now marketing a wide range of products.

Several years ago, Shell decided to expand its grease research by basic studies aimed at providing more adequate understanding of the role of the gelling agent and lubricating base stock as they affect grease quality. This work was placed at Emeryville as there it would have access to

supporting research groups such as those working on colloid and surface chemistry and on theories of lubrication. The research has not only covered the fundamentals of grease made with soap fibers as the gelling agents, but has also been quite active on the use of the newer gelling agents such as finely divided silicas and clays.

For soap greases a major factor in grease quality, requiring close process control, was found to be the achieving of correct soap particle size and shape. With inorganic-base greases this factor is less critical than the correct incorporation of gelling agent into the grease, including the proper use of waterproofing agents which have been found necessary if these greases are to compete with present high quality soap greases. Shell hold several patents in this field and have been able as a result of their basic researches to develop inorganic-base greases that are superior to soap-base greases in both rust-preventive quality and performance at high temperatures.

The Emeryville Research Center is fully equipped and staffed to handle all phases of grease research ranging from use of the electron microscope to examine fine structure, studies of phase diagrams of gel systems, and examination of the role of surface-active agents in greases by correlation with surface-balance measurements, through the manufacture on small and pilot-plant scale of trial lots of new greases, and evaluation of performance in facsimile machine elements. In addition, extensive field testing facilities are available through cooperation with Shell Oil's Research and Product Application Groups.

Publications

The following publications are some of those originating in the Shell Development Laboratory at Emeryville, California:

1. Bondi, A., Cravath, A. M., Moore, R. J., and Peterson, W. H., *Institute Spokesman*, March 1950, "Basic Factors Determining the Structure and Rheology of Lubricating Greases."
2. Stross, F. H. and Abrams, S. T., *J. Am. Chem. Soc.* 72, 3308 (1950). "The Phase Behavior of the System Sodium Stearate-Cetane."
3. Bondi, A. J. of *Colloid Sci.* 5, 458 (1950). "Solubility and Swelling of Alkali Soaps in Organic Solvents."
4. Bondi, A., Caruso, J. P., Fraser, H. M., Smith, J. D., Abrams, S. T., Cravath, A. M., Moore, R. J., Peterson, W. H., Smith, A. E., Stross, F. H., White, E. R., and Wilson, J. N., *Proc. 3rd World Petroleum Congress*, Sec. VII, 373 (1951). "Developments in the Field of Soda Base Greases."
5. Stross, F. H., and Abrams, S. T., *J. Am. Chem. Soc.* 73, 2825 (1951). "Thermal Analysis of the System Sodium Stearate-Cetane."
6. Moore, R. J., and Cravath, A. M., *Ind. Eng. Chem.*, 43, 2892 (1951). "Mechanical Breakdown of Soap-Base Greases."
7. Peterson, W. H., and Bondi, A., *J. Phys. Chem.* 57, 30 (1953). "A Study of Soap Aerogels from Lubricating Greases."
8. Bondi, A., and Penther, C. J., *J. Phys. Chem.* 57, 72 (1953). "Some Electrical Properties of Colloidal Suspensions in Oils."
9. Penther, C. J., and Bondi, A., *J. Phys. Chem.* 57, 540 (1953). "Apparatus for Measurement of Electrical Properties of Colloidal Suspensions in Oils."
10. Bondi, A., *Proc. 2nd International Congress on Rheology* 274 (1953). "Particle Kinetics in Gels."

Martinez Research Laboratory Shell Development Company

Martinez, California

Within the Shell Group of companies technical talent is naturally distributed on a world-wide basis, and the various research laboratories specialize along directions, which to no small extent, are determined by the local environment. At Shell's Martinez Refinery the research effort on grease has been directed mainly toward product and process development. Fundamental studies have generally been limited to those pertaining to specific problems. Close liaison with the larger research centers assures the availability and application of new information arising from their broader investigations.

At the Martinez Refinery of Shell Oil are concentrated the manufacturing facilities necessary to supply their western markets with a wide variety of commercial

greases. This plant is the oldest Shell plant in the United States and one of the oldest on the West Coast. However, its facilities have constantly been modernized so that today it not only embodies the conventional types of grease kettles and compounding equipment but also has a modern continuous plant for multipurpose grease manufacture and excellent packaging and shipping facilities.

To supply the aircraft industry with fuels and lubricants is a global responsibility and it is interesting that development of aircraft greases in Shell is centered at Martinez. This location was particularly favorable because of its proximity to the vast aircraft industry on the Pacific Coast. Very extensive advances were made by the Martinez group during World War II. Modern continuous flow manufacturing units were built for full scale (see article in *Petroleum Engineer*, May 1947, pp. 172, 174, 176) as well as pilot plant work. In addition, facsimile specification bearing rigs and other grease testing equipment are available in a well equipped motor laboratory, where the products are put through high temperature (up to 450°F) and low temperature (down to -100°F) tests.

Advances made in aircraft grease technology often can be applied to industrial greases; this of course provides an added incentive to new studies and developments and extends the laboratory's work. In addition to research and development activities, the Martinez grease research group also provides technical service to the full-range grease plant and to a very active Products Application Department. This is particularly advantageous as it keeps the group abreast of plant problems and of trends in the field.

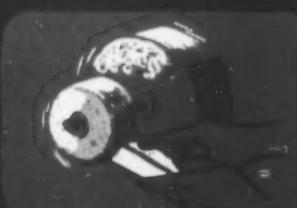
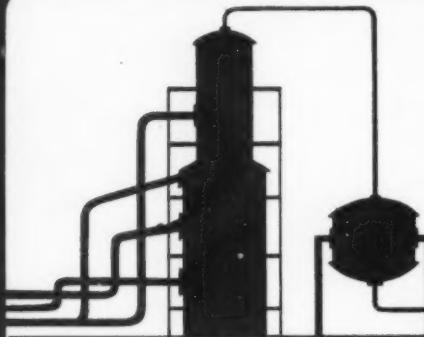
Cooperative studies with the ASTM and CRC are supported by the Martinez Research Laboratory and they are active on several of the committees.



Corner of one of Emeryville's grease laboratories. At left is W. H. Peterson with J. B. Accinelli.



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lubricating
grease
industry



Have you investigated the outstanding qualities of Cenwax A and Cenwax G in the compounding of lithium greases?

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Tide Water Associated Oil Company

Associated, California

Grease Research by the Tide Water Associated Oil Company, Western Division, has been directed mainly in the field of multipurpose type greases.

Properties of a grease which are generally considered to be most desirable in the so-called multipurpose grease are:

- 1. Structure Stability
- 2. Corrosion Protection
- 3. Oxidation Stability
- 4. Application
- 5. Performance

One of the Research projects has been directed mainly in the studies of structure stability, corrosion protection and oxidation stability. The studies on structure stability include shear resistance as affected by oil viscosity and degree of refinement where a soap composition is used and the method used to prepare the grease with the given soap composition. Included as part of the structure stability is the effect oil viscosity and method of manufacture has on oil separation with a given soap composition. Oil separation measured by applied pressure has been studied together with the effect of rate of separation as influenced by temperature.

Corrosion protection has been studied not so much by

incorporating well known and tried corrosion prevention additives, but by investigating special types of soap forming ingredients and the relationship between acidity-alkalinity on corrosion inhibition.

Another project to which considerable time was devoted was the study of Thixotropy of Lubricating Greases in cooperation with Section IV of the Pacific Coast ASTM Technical Committee G on Lubricating Grease of Committee D-2 on Petroleum Products and Lubricants. This

work was to develop a simple worker penetrometer test for measuring Thixotropy of lubricating greases. Shear softening and age stiffening were measured separately. At the outset of this program the committee realized that in order to standardize the test, the grease while being worked had to be maintained at a fixed temperature.

As a means of satisfying this condition a jacket was built around the standard grease worker cup. By regulating the flow and temperature of the circulating water it was possible to maintain a fixed temperature. A means of recording the temperature of the grease in the cup while being subjected to continuous working was also incorporated into the redesigned grease cup.



At left is an external view of the jacketed grease worker. The internal view is shown in the picture at right. (Photos courtesy Tide Water Associated Oil Company)

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Types of Groups in the Los Angeles Area

While write-ups from one University and one petroleum company have been received, development work is no doubt carried on by other oil companies.

University of Southern California Department of Chemistry

Los Angeles, California

Research in Colloid Chemistry Pertinent to the Lubricating Grease Industry

Despite the fact that highly satisfactory greases can be formulated for most applications, scientific understanding of their structure is far from complete. Research in this laboratory is being directed towards interpreting the physical properties of chemically simple analogs of technical greases. We are confident that this approach can lead to significant advances in grease technology.

There are fifteen permanent staff members in the Department of Chemistry at the University of Southern California of whom three (R. D. Vold, K. J. Mysels and H. L. Frisch) form the sector for colloid science. The program of closest pertinence to grease problems forms part of the research of Prof. Vold's group, and has been carried forward over the last ten years by himself and Dr. M. J. Vold and (at varying times) by T. M. Doscher, H. Coffer, R. C. Coswell, G. S. Hattiangdi, J. D. Grandine, 2nd, E. Stanley, H. Scouloudi, J. Pfeiffer, and the current recipient of the National Lubricating Grease Institute Fellowship, Mrs. Valeria Elersich. Dr. Richard Baker of the U.S.C. School of Medicine has collaborated with us in electron microscopy. There are usually three or four active participants in the program at any one time. Financial support is provided currently by the University, the Office of Ordnance Research and the National Lubricating Grease Institute.

In attempting to describe the physical composition of a grease it may be assumed that the dispersed particles of thickener either exert significant forces on each other at close approach, or contact, or they do not. Our working hypothesis is that they do so interact, with the resultant formation of an articulated structure in which both particle and solvent medium play a role, and that the effects on the grease of time, temperature, pressure, shearing stress and the like are to be interpreted in terms of what happens to this structure, including more or less self-healing local ruptures, irreversible ruptures of interparticle structures and, under some conditions, changes

in the shapes and sizes of the primary particles themselves.

The current program embodies two experimental means of testing this hypothesis, making it more explicit and evaluating its utility in accounting quantitatively for grease properties, together with exploratory research into the nature of the forces which are responsible for the development of the articulated structure.

Electron microscopy of grease slices can give a direct view of the structure remaining after solvent removal. Samples prepared by pressing the grease out into a thin film show the effect of the applied stress on the structure. Samples prepared from dilute suspensions were thought at first to give only information about the size and shape of the primary particles, but it now seems likely that the aggregates of particles found in such systems are characteristic of the solvent employed in the dilution and the chemical composition of the grease, and thus can also give insight into the nature of the interparticle forces.

Information about the rigidity and cohesion of the articulated structure is being sought through determination of the extent of orientation of the lath-like constituent units produced by shearing, using X-ray diffraction as a tool to measure the orientation.

Direct experimental demonstration of significant Van der Waal's attractive forces at distances of the order of microns (.001 mm) between glass plates by Sparnaay and Overbeek has stimulated renewed interest in developing a theory as to how such forces may account for the kind of articulated structure responsible for grease properties. During the last academic year the Volds have been pursuing this possibility in collaboration with Professor Overbeek at the Van't Hoff-Laboratorium der Rijksuniversiteit, Utrecht, Netherlands.

In addition to its scientific value the program also has as one of its chief values the development of students into competent scientists able to carry the results forward in the direction of fruitful practical application.

Richfield Oil Corporation

Los Angeles, California

While plans have not been finalized, it is reported that Richfield Oil Corporation will construct a multimillion-dollar research laboratory on twenty acres of land along the Santa Ana Freeway, at the edge of Anaheim City's west limit. Present plans call for an administration building of 37x253 feet in size and a main laboratory and library 71x253 feet in size. Engine laboratories, a pilot plant, and shops will occupy other buildings.

It can be expected that space will be allotted to lubricating grease research in this new laboratory.

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manufacturers

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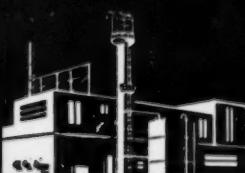
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Titre	8°C.—10°C.
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Color Lovibond 1" Yellow	15—30
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Acid Value	196—199
% F.F.A. as Oleic Acid	98.5—100
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Here are two views of the administration building, Union Oil Company of California, Research Center, Brea, California.

Union Oil Company of California

Brea, California

The NLGI Annual Meeting provides a beautiful opportunity to obtain an intimate view of West Coast manufacturing facilities. One of the most dramatic is the new Research Center of the Union Oil Company of California at Brea. Pictured at the top of this page are two views of their administration building and on the opposite page you see some of the equipment they use.

The lubricating grease research group has made notable contributions to the advancement of this entire industry, particularly through the pages of the *Spokesman*. Consistently since 1944 their technical articles have covered subjects from "Barium Grease" to "Materials Handling . . .".

Outstanding contributions to the *Spokesman* in the form of technical articles are:

L. W. McLennan, "Barium Greases," April and May 1944 issues.
H. J. Worth and L. W. McLennan, "Strontium Greases," July 1947 issue.

L. W. McLennan and R. A. Potter, "Controlling the Consistency of Semi-Fluid Greases," December 1949 issue.

E. Amott, T. D. Smith, and L. W. McLennan, "The Syneresis of Lubricating Oil Greases," July 1950 issue.

E. Amott and L. W. McLennan, "Complexes in Lubricating Oil Greases," March 1951 issue.

Paul F. Lueth, Jr., "Materials Handling in Lubricating Greases Packing Operations," April 1952 issue.

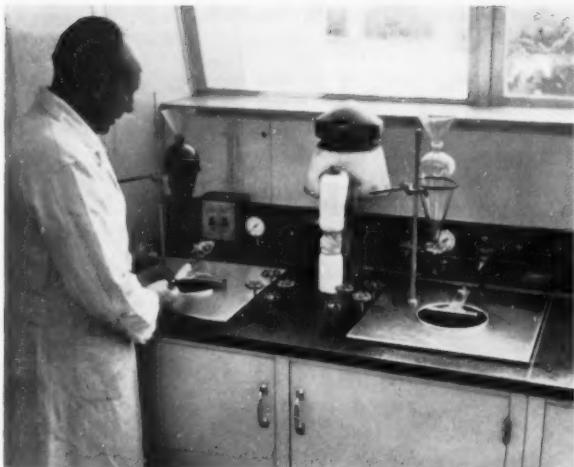
Modestly they state the purposes of their group "are simply to develop and maintain a high quality line of greases at competitive cost, as well as to cooperate with other research laboratories in the sharing of pertinent information and the standardization of test equipment and procedures."

This company has issued a very attractive brochure describing the Research Center at Brea and those who have not had the privilege of seeing this should do so.

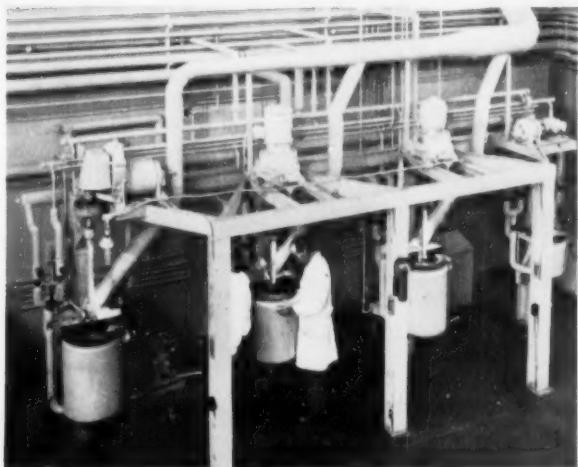
Conclusion

While the material just presented gives you some idea of the groups and the facilities available for research on lubricating greases on the West Coast, it is only in the publications listed that any recognition is given to individuals. To our mind the people involved are the most important factor in the success of the groups we have described. Since we cannot single out investigators and give each person the credit due him, we point out that the reader should meet and talk with these men, most of whom will be at our October meeting.

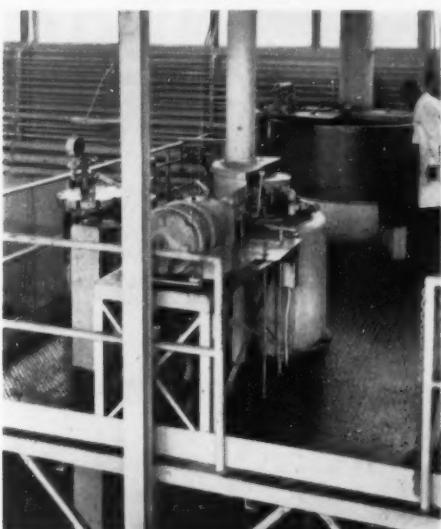
... UNION OIL COMPANY OF CALIFORNIA



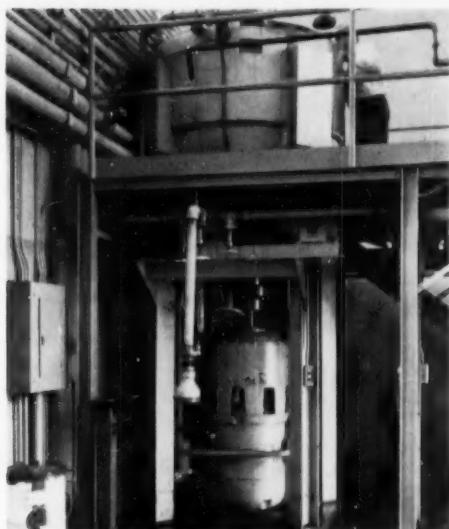
A Union Oil employee in a corner of one of the grease laboratory rooms.



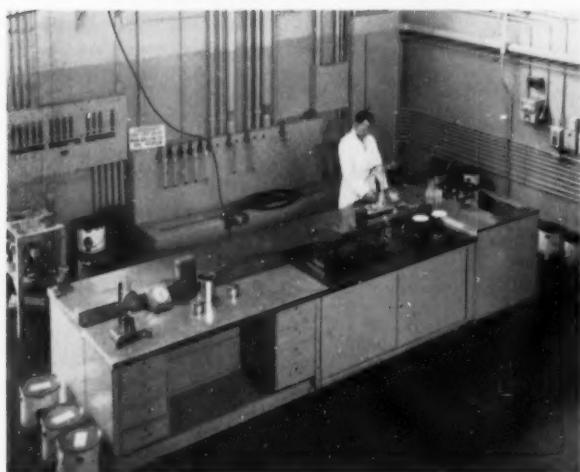
These are ten-gallon kettles.



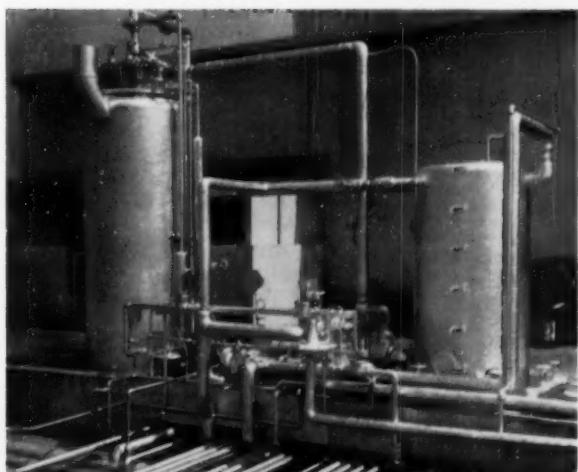
One-barrel and seven-barrel kettles.



View of bottom drive of seven-barrel kettle.



A Union Oil employee in the grease compounding room.



Oil heating equipment used in connection with compounding kettles. (All photos courtesy Union Oil Company of California)

IN ANYBODY'S LANGUAGE —it's still the SPOKESMAN

Here are a few abstracts and an article condensation that have appeared recently in six foreign publications.

Réalisations Industrielles

NOUVELLE SÉRIE

N° 23 - AOUT 1954

Supplément mensuel de L'Industrie du Pétrole (O. Lesourd, édit.), 252, Fg St-Honoré, 8^e, WAG. 40-70 - Abonnement : 1 an 500 fr.

Les Problèmes de la distribution des graisses dans les garages et stations-service

par M. W. PHILIPPE

La Commission Technique du N.L.G.I., Institut National Américain des Graisses, s'est réuni il y a quelques mois dans le but de confronter les points de vue de ses différents membres au sujet du graissage des véhicules dans les garages et les Stations-Service.

L'intérêt de cette session consiste surtout dans le fait qu'étaient présents les représentants des corporations intéressées à ce problème, à savoir les constructeurs d'automobiles, les chaînes de Stations-Service, les fabricants d'appareils de distribution et les fabricants de graisse. En outre, un exposé fut fait au sujet de la méthode proposée pour accorder pratiquement les efforts de chacun dans ces différents domaines.

Il nous paraît intéressant de faire profiter

FRANCE . . . L'Industrie du Pétrole published in Paris is about the size of Life magazine. It devoted four pages to a condensation of the NLGI "Symposium on Dispensing Lubricating Greases in Service Stations and Garages."

NOTIZIARIO

Dalle Riviste Italiane e Straniere

Pubblichiamo i titoli degli articoli, degni di citazione, che appaiono sulle riviste italiane e straniere in dotazione alla biblioteca della Stazione Sperimentale Oli e Grassi. Sulla presente rubrica non compaiono gli articoli, dei quali viene fatto cenno nella «Rassegna di analisi, di teoria e di tecnologia».

A) - OLI MINERALI

- ★ E. G. JACKSON e E. R. BOOSTER: «Grassi lubrificanti per motori elettrici» - *NLGI Spokesman*, XVII, 12, 8, marzo 1954.
- ★ C. KARR: «Valutazione di venti prove qualitative la determinazione dei composti dello» " *Anal. Chem.*, XXVI.

- ★ E. EAGLE, H. F. BMER: «La detos e con gli ale 121, apr.
- ★ C

ITALY . . . On the right is a notation appearing in OLII MINERALI GRASSI E SAPONI COLORI E VERNICI. It's published in Milan.

Analiza masti. (Grease Analysis). C. B. Coenen, R. S. Urner, NLGI Spokesman vol. 17, br. 5, 8-17 (1953). ASTM — metoda za analizu masti ne može se s uspjehom primijeniti na masti, koje sadrže anorganske dodatke za ugušenje, vegetabilna ulja i sapune hidroksi-kiselina. Opisane su dvije metode, koje su se pokazale jednakom upotrebljivim za analizu masti novijeg tipa kao i za konvencionalne masti. U slučaju masti na bazi alk^{II} **F 416: ANALISI DEI GRASSI.**

Analiza masti. (Grease Analysis). C. B. Coenen, R. S. Urner, NLGI Spokesman vol. 17, br. 5, 8-17 (1953). Spokesman, (1953), 17, [5], 8.

Notevole difficoltà si incontrano nell'applicazione del metodo A.S.T.M. D 128-47 alla analisi di grassi contenenti oli sintetici, geli di silice, saponi derivati da ossiacid, e materiali organici diversi. Come è noto il metodo A.S.T.M. contempla la decomposizione del grasso per digestione con acidi minerali, seguita da partizione con solventi dei vari componenti.

Il trattamento acido porta spesso alla alterazione degli acidi grassi e dell'olio base.

In taluni casi il metodo è del tutto inapplicabile a causa della incompleta idrolisi dei saponi o della formazione di miscele gelatinose.

Gli AA. hanno messo a punto due metodi per isolare i costituenti fondamentali dei grassi applicabili anche nei casi in cui il metodo standard si dimostrò inefficace. Il primo

... in 25 to 50%. The accuracy and precision of these methods are adequate or better for commercial work and for analysis of most samples of interest to research groups.

SUBSTITUTED UREAS AS GREASE THICKENERS — E. A. Swakon, C. G. Brannen, L. C. Brumstrum — N.L.G.I. "Spokesman", April 1954.

For numerous applications greases are needed that will give long service over a widening temperature range. Because the range for most fluids is too narrow and because inorganic thickeners interfere with high speed bearings, greases made with organic thickeners in silicone fluid offer the most promise.

were found to have the desired properties. Greases composed

... for over 50% of the time.

ENGLAND . . . right is another SPOKESMAN abstract that appeared in BLOGRO June issue.

IMPROVED METHODS — GREASE ANALYSIS — C. B. Coenen and R. S. Urner — N.L.G.I. "Spokesman", August 1953.

Considerable difficulty has been encountered in applying ASTM D128-47 Method 1 to the analysis of greases containing synthetic oils, silica gels, hydroxyacid soaps and miscellaneous organic materials. This ASTM method involves decomposition of the grease by digestion with mineral acid, followed by solvent partition of the various components. Such drastic treatment frequently

... position of some of the fatty acids and oil-base constituents. In some

ENGLAND . . . abstract that appeared in BLOGRO, published by British Lubricating Oil and Grease Research Organisation, Limited.

JAPAN . . . on the left is reproduced the cover of THE KYODO GREASE TIMES, published by the Kyodo Yushi Company in Tokyo. This cover is placed on back page and magazine reads from back to front.

Right . . . is page abstract from SPOKESMAN on "Silica Aerogel Grease." This is translation of heading. Kyodo Yushi Company is a new Active Member of NLGI and expects to be represented at Annual Meeting in San Francisco.



シリカ・グリースについて

(Institute Spokesman, Jan 1953, page 18-29)



PROGRESS THRU RESEARCH . . . at GENERAL MILLS

Fatty Acids Reduce Off-Grade Greases, Help You Maintain Constant Grease Consistency Up Grease Yields

One Answer to The Problem of off-grade grease batches lies in the purity and uniformity of the fats you use. General Mills offers you a variety of pure, constantly-uniform fatty acids designed especially for making greases of consistent quality.

Now you can suit your fat compositions more closely to your needs—even to special greases tailored for polar-zone army equipment, high-speed engines, stratosphere airplane, and other new uses. That's because General Mills takes extra precautions with its fatty acids. The myristic and palmitic acid content is controlled carefully with improved separating and distilling methods. Careful selection of tallow insures a rigid control on linoleic and stearic acids.

In the long run, off-grade grease batches caused by impure or improperly balanced fats cost you



Reliable grade and stability of grease are essential for military equipment such as the tank shown on Polar maneuvers, above.

much more than the cost of modern fatty acids. That's why many manufacturers . . . formerly satisfied with whole fats . . . are ordering General Mills fatty acids.

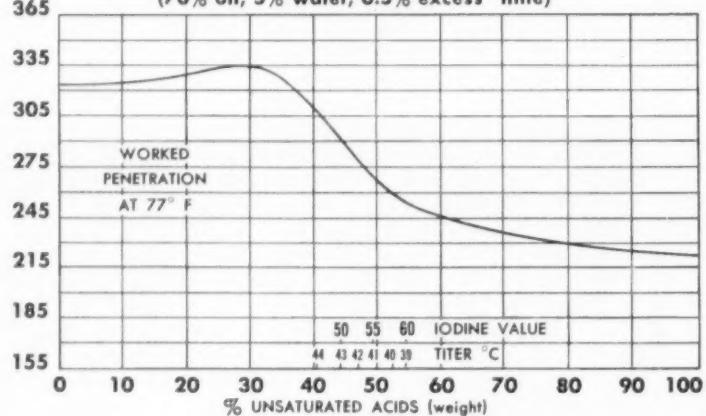
Help yourself avoid a typical grease production problem! Grease consistency can drop drastically from just a slight variation in the saturated acid content of your fats. Take a look at the graph above.

The scale shows the abrupt drop

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(70% oil, 5% water, 0.5% excess lime)



in grease consistency caused by only a slight change in saturated acid content of fats.

See how the penetration drops fast as unsaturated acid content passes about 35 per cent? Well, here is where General Mills fatty acids can do you the most good. You can solve your problem of finding a source of supply which will have uniform composition, time after time, by ordering General Mills fatty acids.

You Can Boost Grease Yields with General Mills fatty acids, too. They have about 5 per cent more reactive materials than whole fats, so they saponify almost completely, and

often boost grease yields 10 to 25 per cent higher.

In addition, you get faster "kettle turnover" for fatty acids saponify almost instantly. Naturally, this speeds production and helps cut your operating expenses.

General Mills has also brought to grease making the modern way to cut handling costs. Saturated fatty acids are now available in pallet shipments at no extra charge; 50 pound multiwall paper bags glued to disposable corrugated paper pallets—40 to 60 bags to the pallet. You simply handle the bags with a lift truck.

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Patents and Developments

Bentonite Greases

The expensive and time-consuming milling step claimed to be necessary in the dispersion of organophilic bentonites, is said to be eliminated by treatment with a polar material to form a slurry for spreading the lattice structure of the modified clay. The desired lubricating oil then is worked in gradually into a slurry, according to the Standard Oil Development Company patent 2,677,661, until a suspension is obtained containing all of the required oil. The batch is then heated, the polar material distilled off, leaving the bentonite-oil system as a heavy grease.

It is preferred to use the bentonite complexes of 10-18 carbon amines, and the method is especially adaptable to the primary amine complexes since, in these, the lattice structure of the bentonite is believed to be not completely coated with polar material, and the oil used will not penetrate into the system. By use of the polar material, the lattice structure is completely coated and the oil enters the system easily.

Polar materials suitable for this purpose include isopropyl alcohol, ethyl ether, toluene, xylene, etc. Ordinarily, equal parts of the bentonite complex and the polar material are operable. A grease formed by using 5-50% of the filler has satisfactory structural stability.

An example of preparation of this type of grease is as follows: 15 parts by weight of a complex formed from a

bentonitic type clay and a primary aliphatic amine salt (octadecyl amine hydrochloride) was mixed with an equal amount of 91% isopropyl alcohol (a small amount of additional alcohol may be added if it appears necessary to completely wet the complex). Into this mixture was added 85 parts of a Coastal distillate having a viscosity at 210°F. of 50 S. U. S. The mixture was slowly worked to break up all lumps and until a smooth slurry was obtained. When the oil was all worked into the mixture, the batch was heated at a temperature of 200-210°F. for three hours to drive off the solvent. The temperature necessary to strip the product depends on the volatility of the solvent used. The heat was then removed and the material stirred until it cooled to room temperature.

Inorganic-Gelled Fluorocarbon Grease

Chlorfluoro and completely fluorinated hydrocarbons and their polymers possess excellent resistance against nitric acid and similar corrosive chemicals, but no greases have heretofore been prepared from these materials. In U. S. Patent 2,679,479, Shell Development Company describes preparation of lubricating greases in which the lubricating phase is a completely halogenated hydrocarbon oil wherein the halogen has a molecular weight less than 40 and wherein at least about 3 out of every 4 halogen atoms in the molecule are fluorine atoms, the oil being gelled by an inorganic gelling agent having a hydrophobic acid-resistant monomolecular surface coat-



SWITCH from open kettle method to processing with VOTATOR* Continuous Heat-transfer Apparatus has given Shell Oil Company these results in the manufacture of lithium hydroxystearate grease: Higher production rate; lower labor costs; lower soap costs; no fire hazard with low-flash oils; uniform consistency; saving in floor space.

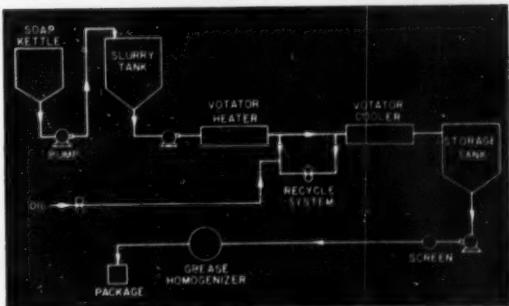
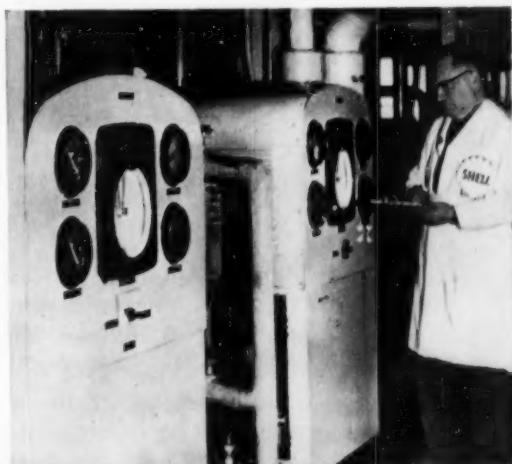
Find out how *you* can benefit with Votator Grease Making Apparatus. Write The Girdler Company, Votator Division, Louisville 1, Kentucky.

*VOTATOR—Trade Mark Reg. U. S. Pat. Off.

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Flow diagram of process used by Shell



The user cannot see it by looking in the container, but when he finds a lubricant doing an outstanding job, it's 2 to 1 a Metasap Aluminum Stearate Base is incorporated therein.

For Metasap Aluminum Stearates are today's *foremost* development in grease making. Lubricants made with them are moisture-proof, temperature-resistant, water-repellent . . . clear and uniform . . . able to perform superlatively under the toughest conditions.

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ing, preferably chemically united. These greases contain a minor amount of completely fluorinated organic compound having 3-18 carbon atoms per molecule.

Such greases are claimed to possess unique properties, such as resistance to attack by strong acids and oxidizing agents, and they are highly water resistant. Also, they have the surprising property of wetting metal surfaces preferentially, making them of special importance for lubricating aircraft parts in contact with strong oxidizing agents, such as concentrated nitric acid used as fuel. Due to their high density, they are suitable for use in submarine and other submerged mechanisms. In the absence of perfluoro polar compounds, unsatisfactory lubrication is obtained.

While salts and soaps of perfluoric polar organic compounds may be used, they should be present in amounts which do not cause thickening of the cold composition. Such compounds may be completely fluorinated butyric, valeric, etc. acids, or the alcohols, esters, etc. The fluorocarbon oils may be polymers of chlorotrifluoroethylene, particularly those in the molecular weight range of 650-1000. The thickener may be surface-esterified silica, particularly where the esterifying alcohol is an aliphatic alcohol having 3-12 carbon atoms. Other thickeners may be onium clays, coated gels (such as those disclosed in patent 2,584,085), etc.

The essential ingredients in the composition are:

Parts by weight

Perfluorocarbon oil.....	70-98
Hydrophobic gel.....	1-20
Perfluoro polar organic compound..	1-10

A fluorocarbon lubricating oil having the trade name "Standard Fluorolube" produced by Hooker Chemical Corp. was gelled to a grease consistency with a silica aerogel. This grease performed satisfactorily in a bearing test under anhydrous conditions. However, upon addition of a small amount of water the grease structure was rapidly destroyed and bearing lubrication was immediately lost. A modification of this grease was made by replacing silica aerogel with a silica having approximately similar surface area (in the order of 600 square meters per gram) the surface being esterified with butyl alcohol so that the butylated silica contained approximately 9.5% isobutyl radical. 5% of this butylated silica was used to gel the same fluorocarbon oil. The grease which resulted was resistant to the action of nitric acid and its structure was maintained even in the presence of water. However, during a bearing operation test, when water was added the latter displaced the grease from the bearing surface and caused the bearing to run hot and also resulted in excessive bearing corrosion. This second grease was modified by the further addition thereto of 2% by weight of perfluorocaprylic acid based on the total grease composition. The modified grease was resistant to the action of concentrated nitric acid, maintained its structure in the presence of water and adhered strongly to bearing surfaces, even in the presence of water, thus protecting the bearing from hot operation and from corrosion as well.

Among other ingredients added are perfluorocapramide, perfluorostearyl alcohol, fluorobutyronitrile, etc.



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Representative—Frank C. Haas

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Representative—H. F. Whitter

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Representative—H. H. Fritts

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Representative—Eugene W. Adams

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Representative—J. W. Newcombe

National Lead Company

Baroid Sales Div., 111 Broadway, N. Y. 5, N. Y.
Representative—H. H. Farnham

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1270 Ave. of the Americas, N. Y. City 20, N. Y.
Representative—Richard Bender

Newridge Chemical Company

600 North Wells Street, Chicago 10, Illinois
Representative—T. E. Shine

M. W. Parsons—Plymouth, Inc.

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Representative—Herbert Bye

Synthetic Products Company

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Representative—Garry B. Curtiss

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Vopcelene Division
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Representative—C. F. Williams

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Division Sun Chemical Corp., 10-10 44th Ave.
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PEOPLE in the Industry

Robinson Speaks on Textile Lubrication

Dr. Edwin A. Robinson, vice-president of Nopco Chemical Company, introduced a new topic "Lubrication of Textile Fibers" at the summer session on Lubrication Engineering sponsored by Massachusetts Institute of Technology.

As Dr. Robinson pointed out, "Although metal parts are employed as guides by the textile processing industries, the textile fibers or yarns are lubricated rather than the metal surfaces. Unlike mechanical lubrication problems, most lubricants applied to textile fibers and yarns must be capable of easy removal in scouring baths containing aqueous solutions of detergents."

Among the factors considered to affect frictional forces, he included the properties inherent in different fibers, the effects of modifying fiber size and surface, the varying speeds at which mechanical processing takes place, and the use of chemical specialties . . . all

contributing to the necessity of many tailor-made lubricants. Emphasizing that each ingredient used in formulated lubricants exerts its influence on the over-all lubrication effect, Dr. Robinson cautioned that only those ingredients which are favorable to the specific textile process should be used.

"Besides considering the frictional values between textile fibers or yarns and various surfaces over which they are processed, the frictional forces existing between the fibers as they are drawn on each other play an extremely important part in the uniformity of the resulting spun yarn; this influences the strength properties of these yarns." Dr. Robinson stressed that "This balance between fiber-to-metal friction and fiber-to-fiber friction must be controlled within narrow limits which vary with each textile fiber. To add to these complications, control of static electricity has become paramount with the introduction of the newer low-moisture-con-

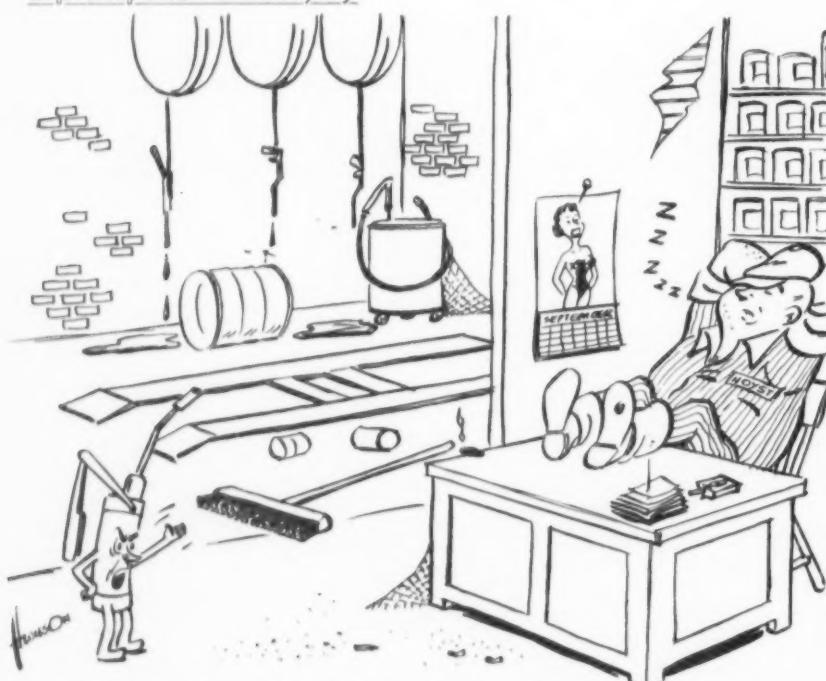


DR. EDWIN A. ROBINSON

tent thermoplastic textile yarns and fibers. It must be controlled, and the balanced lubricant must contain not only those ingredients which exert the desired friction properties, but also an adequate quantity of an effective antistatic chemical."

Dr. Robinson is manager of the Textile Chemicals and Textile Fibers Departments of Nopco Chemical Company, Harrison, N. J. He also heads the company's Industrial Development and Research Laboratories.

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"TSK, TSK! I WISH HOYST WOULD ATTEND THAT N.L.G.I. MEETING!"

U. S. Steel Sends Borwick to St. Louis

William J. Borwick has been appointed manager of the St. Louis district of United States Steel Supply Division of U. S. Steel Corporation, it has been announced by C. W. Lord, vice president of the warehousing division. Borwick succeeds L. F. Niemann, who is retiring after 43 years service.

Borwick was born in Newberg, Ore., Oct. 8, 1912. He joined U. S. Steel Supply in 1948 as a purchasing and stock records supervisor in the Los Angeles warehouse. He was promoted to office manager in 1949 and became assistant district manager in 1951. In 1953 he was advanced to district manager in Portland, Ore., the position he held until his present appointment.

Socony Announces Personnel Changes

Changes in management at Socony-Vacuum refineries in East Providence, R.I., and Olean, N.Y., to fill vacancies created by retirements have been announced.

Hamilton P. Caldwell, Jr., becomes manager of the East Providence refinery, replacing Henry A. Rickett who will serve as consultant to the refinery's management until his retirement at the end of the year with more than 40 years service.

Mr. Caldwell joined General Petroleum Corporation, Socony-Vacuum's West Coast affiliate, in 1934 following his graduation from Purdue University with a BS degree in chemical engineering. In 1936 he was transferred to the company's research and development department at Paulsboro, N.J., where he became supervisor of the refining section of the process division. He was transferred to the East Providence refinery as assistant superintendent in 1953.

Mr. Rickett, a graduate of Worcester Polytechnic Institute, joined the old Standard Oil Company of New York as a research chemist in 1914 and in 1918 became assistant superintendent of the grease and compounding works in Brooklyn, N.Y. He was transferred to the East Providence refinery in 1919 and placed in charge of the laboratory. He was appointed assistant superintendent of the refinery in 1932 and superintendent in 1947. He has been active in many civic and social groups of East Providence, including the Planning Board, Recreation Board and the Boys Club.

Frank V. Williams was appointed manager of the Olean, N.Y., refinery, assuming the post formerly held by Walter E. Wanner, who has retired under the company's annuity plan after 38 years in Olean. Socony-Vacuum had announced in May that the Olean refinery was to be shut down. Mr. Williams will be in charge of this operation, after which he and other employees not eligible for special retirement or termination arrangements will be offered posts at one of the company's 13 other refineries.

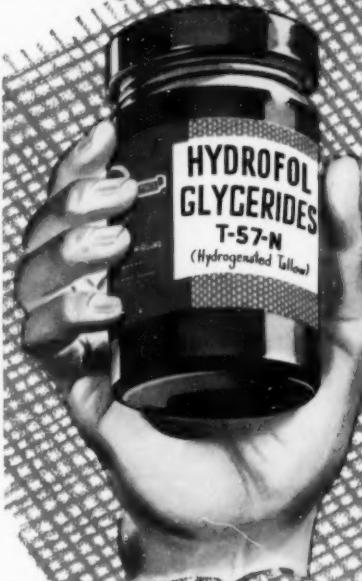
Mr. Williams, formerly assistant superintendent at Olean, was graduated from the Drexel Institute of

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Iodine Value	1.0 Max.
Titre °C	57-61
Melting Pt. °C	59-64
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Technology in 1933 with a BS degree in mechanical engineering. After working on various petroleum processing units in the Paulsboro, N.J., refinery from 1935 to 1940, he was made night superintendent. He was transferred to Olean refinery in 1945 as assistant superintendent.

Mr. Wanner was graduated from Cornell University as a mechanical engineer in 1913 and joined the Olean refinery as assistant to the chief engineer in 1916. He served in this post until 1929 when he became chief engineer. A year later he was appointed assistant superintendent of the refinery and in 1945 superintendent. During World War II he served for several months as a petroleum analyst with the refining division of the Petroleum Administration for War. He is a member of the Olean Exchange Club and several state and national professional engineering societies.

E. R. Hayes Passes Away

E. R. Hayes, Midwest territorial supervisor of the Acheson Colloids Company, Port Huron, Mich., died on July 19th in Chicago, Ill., at the age of 52.

Mr. Hayes, originally from Newburyport, Mass., attended Massachusetts Institute of Technology in the class of 1927. An electrical engineer, Mr. Hayes joined the Acheson Colloids Company in 1938. From 1938 until 1951, he served in Acheson's Detroit offices as service engineer for Michigan. In 1951 Mr. Hayes was transferred to the Chicago offices of the company, and served as Midwest territorial supervisor until his untimely death.

Lubricate for Safety

Rheem Executive



Pictured above is Lieutenant General Albert C. Wedemeyer (USA, Ret.) who recently joined Rheem Manufacturing Company as a vice-president and director.

George Round Retires from Socony

George A. Round, chief automotive engineer of Socony-Vacuum Oil Company, Inc., has retired from the automotive division of the lubricating department after 40 years of service.

He was graduated from Brown University in 1910 with a BS degree and in 1914 joined the Vacuum Oil Company in Boston as an automotive engineer. He came to the New York offices in 1919 and when Vacuum merged with Standard Oil Company of New York in 1932, Mr. Round continued as an automotive engineer with Socony-Vacuum. In 1939 he was made chief automotive engineer.

During World War II Mr. Round was technical consultant on fuels and lubricants for the ordnance department of the U.S. Army.

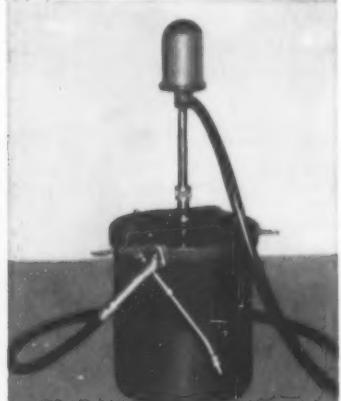
Since retirement he has become technical consultant for the lubrication committee of the American Petroleum Institute and is a member of the Society of Automotive Engineers and the American Society for Testing Materials.

Leonard Raymond, formerly as-

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sistant chief automotive engineer, has succeeded Mr. Round.

He joined the research and development department at Paulsboro, N.J., in 1945, coming from Tide Water Associated Oil Company where he was supervisor of the automotive laboratory. Until 1953, when Mr. Raymond came to the New York headquarters as assistant chief engineer, his work was concerned primarily with the development and application of fuels and lubricants.

Mr. Raymond was graduated from Columbia University with a master's degree in chemistry in 1928. He is a member of the Society of Automotive Engineers, American Society of Mechanical Engineers and the American Chemical Society. He has also been active in the Coordinating Research Council.

Seal Honored by Socony

John F. Seal, a director of Socony-Vacuum Oil Company, Inc., and vice president in charge of finance, has completed three decades of service with the company. George V. Holton, chairman of the board, marked the occasion at a directors' meeting by presenting Mr. Seal with a 30-year pin.

Mr. Seal joined the company in 1924 as assistant treasurer of Vacuum Oil Company, one of Socony-Vacuum's predecessors. With the merger in 1931 of Vacuum and Standard Oil Company of New York (Socony) he became assistant treasurer of Socony-Vacuum. He was made treasurer and a director in 1946 and a vice president in 1947.

Tumpeer Advances At Witco

Joseph J. Tumpeer has been appointed Senior Vice-President of Witco Chemical Co., New York, directing its Pioneer Asphalt Division.

Mr. Tumpeer has been affiliated with Witco since February 1921. He served initially in the Chicago office, and later was appointed Vice-Presi-



JOSEPH J. TUMPEER

dent and General Manager of Witco's Pioneer Asphalt Division, which has plants at Perth Amboy, N.J., and Lawrenceville, Ill.

Senior Vice-President Tumpeer occupies offices at Witco's New York headquarters.

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Hoover to Vulcan



DONALD R. HOOVER

Herbert B. Scharbach, Vice President and Sales Manager, Vulcan Stamping & Mfg. Co. and Vulcan Tin Can Co., has announced the appointment of Donald R. Hoover as sales representative assigned to the greater metropolitan Chicago Area.

Mr. Hoover is a graduate of Mich-

igan State University where he majored in Economics and Marketing. The three years following graduation were devoted to Army service which he concluded as First Lieutenant in the Quartermaster Division.

Changes Made In Du Pont Staff

The Du Pont Company has announced establishment of a new Organic Chemicals Department sales training section under Emory M. Fanning and assignment of William A. Bours, III, as assistant sales director of the "Kinetic" Chemicals Division, replacing Mr. Fanning.

Francis L. Shackelford, Jr., for the past year assistant sales development manager for the Rubber Chemicals Division, has been named chemical sales manager of the Dyes and Chemicals Division, replacing Mr. Bours.

Mr. Fanning, a native of Asheville, N. C., and a graduate of Wake Forest College, joined the Du Pont Company in 1929 as a trainee in the dye sales and service section and from 1930 to 1933 served in the Boston sales office of the Dyes Division and the Chicago office of the Alcohol Sales Division. In 1933, he became sales

manager of the Alcohol Division and when that section was consolidated with the Tetraethyl Lead Division in December, 1945, he was made assistant sales manager of the Petroleum Chemicals Division. He served as sales manager of the latter from August, 1946, to April, 1950, when he became assistant director of sales for the "Kinetic" Chemicals Division.

Mr. Bours, 35-year-old native of New York City, was graduated from Princeton University with a bachelor of arts degree in 1939 and a bachelor of science degree in engineering the following year, then took his master of science degree at Columbia University in 1941. He joined Du Pont's Engineering Department in 1941 and worked in the Chambers Works at Deepwater Point, N. J., until 1950, when he became sales development manager of the Fine Chemicals Division of the Organic Chemicals Department. He was named manager of the plant's technical section in 1951 and a year later became sales manager of the Chemicals Division.

Mr. Shackelford, native of Greenville, S. C., obtained his bachelor of science degree in chemical engineering from Georgia Institute of Tech-

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nology and his master's degree from Massachusetts Institute of Technology. He joined Du Pont's Organic Chemicals Department in September, 1939, as an analytical chemist and during World War II served in supervisory positions at war production plants and at the company's Louisville, Ky., neoprene plant. From October, 1945, to May, 1950, he was a production supervisor and chemical engineer in the dyes intermediates section of the Chambers Works at Deepwater Point, N. J., after which he joined the sales staff of Kinetic Chemicals, Inc.

U. S. Steel Appointments

The appointment of L. J. Rohl to the newly created position of chief metallurgical engineer of United States Steel Corp. was announced recently by Harvey B. Jordan, executive vice president of operations.

At the same time it was announced that R. W. Simon has been named to succeed Mr. Rohl as chief metallurgical engineer, operations—steel.

Mr. Rohl joined U. S. Steel at South Works, Chicago, Ill., in 1917. He advanced through the positions of product metallurgist, assistant su-

perintendent of alloy production, assistant superintendent of the production department, and superintendent of production. In 1933, he became assistant to the general superintendent of South Works and later that year he was appointed assistant manager of the Chicago District metallurgical division. In 1943, he was made manager of this division and was promoted to the position of assistant chief metallurgical engineer in 1947.

Mr. Simon joined U. S. Steel in 1927 as a metallurgical assistant at Homestead Works. He served in various metallurgical and administrative capacities at Duquesne and Youngstown Works until he was appointed as a metallurgist to the Pittsburgh general office metallurgical staff in 1935. In 1939, he was made assistant manager of the Pittsburgh District metallurgical division and was appointed manager of the division in 1942.

He is a member of the American Institute of Mining and Metallurgical Engineers, American Iron and Steel Institute, American Society for Metals, American Society for Testing Materials, Association of Iron and Steel Engineers, and the Engineers Society of Western Pennsylvania.

Luckenbach Rejoins Foote



FRED LUCKENBACH

Fred Luckenbach, who played a major part in developing the lithium base grease market for Foote in the years 1941 thru 1947, rejoined the Foote Sales Department in June.

Luckenbach succeeds Fentress as Manager of Chemical Sales and is charged with the marketing of lithium hydroxide to the petroleum and allied industries. He will also handle the sale of special chemicals now under development.

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Industry NEWS

Gulf to Supply Mexican Airline

Aeronaves de Mexico, a major Mexican airline operating about 40% of the commercial planes in that country, has granted a contract for the exclusive supply of its aviation lubricating oil to Gulf Oil Corporation, the latter company has revealed.

The airline has been using Gulf oils for some months, the oil firm stated.

Aeronaves recently merged with another air carrier, Lamsa (a former United Air Lines subsidiary); and it operates a second line, Aerovias Reforma (included in the contract). The combined companies fly routes covering approximately 7,000 miles.

The current contract, which covers lubricants for all Aeronaves aircraft, was negotiated by Mexairco, a

sub-jobber for D. M. Arbuckle, jobber of branded Gulf products in Mexico. Agreements were also made to supply Gulf oils for the line's ground and shop equipment.

An important feature in the transaction was an arrangement by Gulf to furnish lubrication engineering service to Aeronaves.

This service has already begun with a survey of the line's base at Torreon, Coahuila Province, which handles the overhaul and servicing of both airplanes and engines. A lubrication study was also made of shop equipment; and methods recommended to facilitate an increasing work load have been put into effect.

Gulf has previously been active in the Mexican aviation market in supplying a number of executive fleets, including those of the Bank of Mexico and the Federal Electric Commission.

Shell Introduces New Oil

Increases in gasoline mileage during stop-and-go driving and cuts in oil consumption have been achieved in passenger cars using a new multi-grade motor oil developed by Shell Oil Company, it has been announced.

According to J. G. Jordan, vice-president in charge of marketing, the new oil achieves the economies by maintaining less change in viscosity over the entire range of engine temperatures. It flows instantly at low temperature, thus reducing engine drag and permitting more efficient use of fuel. This results in better gasoline mileage. It does not become too thin during high-speed, high-temperature operation and so gives greater protection and less oil consumption than oils with conventional viscosity-temperature change characteristics.

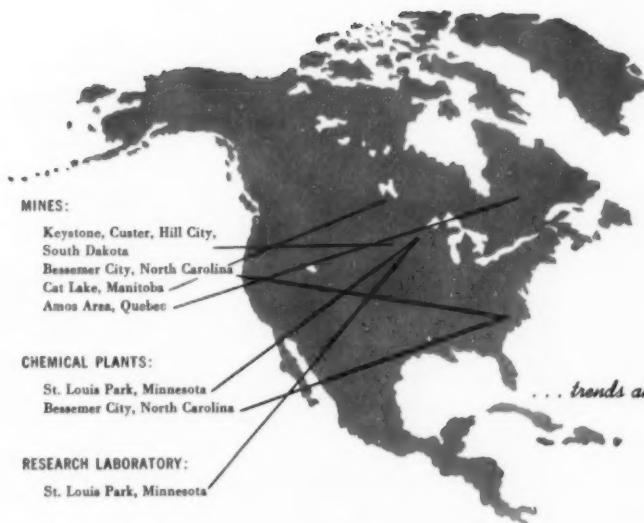
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Alemite Publishes "Comic Book"

In a lively, fast-paced "comic book," cartooning and lampooning all of the grease-splotched misadventures encountered with old-fashioned industrial lubrication practices, the Alemite division of Stewart-Warner Corporation has just published a definitive and fact-packed presentation of centralized lubrication titled "Ask Anyone in Industry."

The 24-page, side-pocket sized booklet is described by Tom Murphy, Alemite industrial sales manager, as a sales brochure in comic relief, which "isn't catalogish, preachy nor high pressure," with no page containing more than eleven words of type matter. But through its fast reading pages scramble distracting sweater girls, frustrated grease monkeys, finger-losing oilers who forgot to turn off the machine before squirting, and a host of other delineations of "characters," foibles and fallacies all too familiar to people in industry.

Naturally, it comes out in the final few pages of the brochure that the use of Alemite "Accumeter" measuring fittings—connected by tubing to a lubrication pump controlled by an automatic timer—eliminates all of the down-time, safety hazards, bearing failures, lubricant waste and other negatives inherent in outmoded types of lubrication.

Plant lubrication and maintenance officials who want to learn the A-B-C's of centralized lubrication—or indoctrinate anyone else, from greenest helpers to their chief engineers—are invited to request the booklet, "Form 34-22," from Alemite Industrial Department, 1826 Diversey Parkway, Chicago 14, Ill., or any Alemite Distributor.

Fatty Chemicals Catalogue Published

Just off the press is a new 40-page technical catalogue of fatty chemicals published by Archer-Daniels-Midland Company.

The booklet is written from a functional standpoint. It is subdivided into four major product classifications, Fatty Acids, Glycerides, Sperm Oils, and Fatty Alcohols. Each section is then classified into reaction data, specifications, composition and application information.

Chek-Chart Recommendations Booklet Published

A pocket-size edition of the Chek-Chart Recommendations Booklet is announced for 1954 by the publisher, The Chek-Chart Corporation, Chicago.

Especially designed for quick, easy reference in service station pump-island service, the new booklet, 4½ x 8½ inches, slips in and out of a pocket easily. The booklet is bound along the 8½-in. side so that when opened, page size is 8½ x 9 inches—ample room for easy-to-read type matter. Within a total of 32 pages, the booklet lists recommended motor oil and gear lubricants for passenger cars, trucks and farm tractors.



Chek-Chart Booklet

For passenger cars, coverage of all U. S. makes extends from 1941 through 1954 models in most cases. On some makes coverage goes back through 1938 models. More than 85% of total car population is covered in the passenger car section. The data includes recommended motor oil for the crankcase; recommended gear lubricants for the transmission and differential. Capacity data for these units is also shown.

Truck data includes all popular models of 20 U. S. makes, listing 1946-through 1954-built vehicles in most cases. Motor oil recommendations for the crankcase and gear lubricant recommendations for the transmission and differential are tabulated. Capacities of these three components are also shown.

Farm tractor information covers the models of the 16 tractor manufacturers whose units account for most of

the tractor population. Recommended lubricants for the crankcase, transmission and differential and final drive are listed for each model. Capacity data for each of these components are shown.

ACHEMA XI to Meet In Frankfurt

Invitations to the Achema XI—Chemical Apparatus and Equipment Congress and Exhibition—to be held in Frankfurt am Main during the period May 14-22, 1955, are now being issued. A pamphlet of eight pages, format DIN A4, gives a good preview of the series of functions in connection with chemical engineering and the chemical apparatus and equipment fields that the DECHEMA—Deutsche Gesellschaft für chemisches Apparatewesen—is arranging.

Over 600 firms from 12 different countries will exhibit the latest developments of their production together with their old-established lines. Many thousands of units of machinery, apparatus, equipment and complete plant, representative of all branches of chemical engineering, regulating and control equipment, constructional materials and laboratory equipment for all the varied fields of chemical research, will be on show in eleven exhibition halls of a total floor space of 46,000 square metres.

The "ACHEMA Congress City," which will be established in the Exhibition Grounds of the City of Frankfurt am Main, will include, in addition to the eleven exhibition halls previously mentioned, the Congress House, the Reception Hall, the Foreigners' Club and the "Dechema Haus." All these will have a total floor area of no less than 210,000 square metres.

The 1955 Congress of the European Federation for Chemical Engineering will be held in conjunction with the Achema XI Congress together with the active co-operation of the 19 technical and scientific societies, representing 11 different countries, that form the European Federation for Chemical Engineering. At the same time, special meetings of the "Gesellschaft Deutscher Chemiker" and other technical and scientific societies, as well as the Annual General Meeting of the DECHEMA will also be held.

API to Release New Motion Picture

A dramatic moment in history—the beginning of the U. S. oil industry near Titusville, Pa., in 1859—is re-created in a colorful new motion picture which will make its public debut in October, at the beginning of Oil Progress Week.

Produced by the American Petroleum Institute, "The Story of Colonel Drake" tells the struggles and disappointments of the little group of pioneers who ignored harassment and ridicule to bring in the nation's first commercial oil well.

The new motion picture is a Technicolor production and stars actor Vincent Price as Edwin L. Drake.

To insure its authenticity, Paul M. Giddens, former curator of the Drake Well Memorial Museum and one of the leading historians on the early days of oil, served as Technical Advisor during its preparation and filming.

All of the history-making men are in the motion picture—Brewer, the Pennsylvania lumberman, and Townsend, the Connecticut banker who be-

lieved oil could be found in commercial quantities; Bissell and Eveleth, the first promoters, and "Uncle Billy" Smith, the salt-well driller whose skill and loyalty to Drake helped bring the dreams of all into reality.

From the opening scene in the office of James M. Townsend at the City Savings Bank of New Haven, Conn., in 1857, the motion picture relives the discouraging series of experiences which preceded Drake's climactic discovery. It concludes with a quick series of views of the modern oil industry and points out how the men and women of oil have kept the faith by serving the American people well, and supplying them with an abundance of petroleum products.

"The Story of Colonel Drake" is 29 minutes in length, and is available in both 16-millimeter and 35-millimeter. Prints may be borrowed through any of the District Offices of the Oil Industry Information Committee, and from many of the oil companies. A limited number of prints are still available for purchase—\$125.00 for 16-millimeter, and \$350.00 for 35-millimeter.

The motion picture will not be

available for public showing or for television until October 10—the beginning of Oil Progress Week.

"The Story of Colonel Drake" was planned and supervised by Film Counsellors, Inc., New York, for the Institute, and the Oil Industry Information Committee's Film Subcommittee, which is headed by H. L. Curtis, of Shell Oil Co.

Nopco Expanding in Canada

Yocum Faust, Ltd., a subsidiary of Nopco Chemical Company of Harrison, N. J., has awarded a contract for an additional manufacturing unit to be erected on their land at the London, Ontario plant. According to T. A. Printon, President, ground has already been broken; and the new \$250,000, four-story, fire-proof structure will be erected as fast as men and materials are available.

It is anticipated that in addition to products of Yocum Faust, Ltd., certain ones of Nopco Chemical Company (Canada) Ltd., will be manufactured in the new facilities. Nopco recently formed the Canadian Company.



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API Picture to Be In Edinburgh Film Festival

For the third time in four years, a motion picture produced by the American Petroleum Institute has been selected as one of the U. S. entries in the Edinburgh Film Festival.

Latest winner of this high international honor is "American Frontier," the dramatic documentary which tells the story behind the story of the dis-

covery of oil in the Williston Basin in North Dakota.

Previous films shown at this Scottish film festival—which is one of the top festivals in the world—were "Man on the Land," and "24 Hours of Progress."

"American Frontier" was released for public showing last October—at the beginning of the industry's Oil Progress Week observance. Since then

it has been seen in theaters, on television, and at meetings, rallies and other special events.

It was filmed on the spot, and is authentic to the last detail. It portrays what happens when oil is discovered in a new area. Instead of the old-time "Boom or Bust" atmosphere, it recounts how far-sighted planning by oil industry and civic officials brought about orderly development and growth in the Williston Basin.

Notable among "American Frontier's" credits are Willard Van Dyke's direction, and Richard Leacock's photography. An original musical score, composed by Melvin Powell, is performed by members of the New York Philharmonic-Symphony Society, under the direction of Alexander Smallens.

ASME-ASLE to Hold Joint Lubrication Conference

D. F. Wilcock, General Electric Co., Schenectady, N. Y., Chairman, announced that there will be a Joint Lubrication Conference sponsored by the Lubrication Activity Committee of the American Society of Mechanical Engineers, and the American Society of Lubrication Engineers at the Lord Baltimore Hotel, Baltimore, Md., Oct. 18 and 19, 1954.

According to Mr. Wilcock there will be five Sessions covering Rolling Element Bearings, New Developments in Hydrodynamic Lubrication, Bearing Instability, Hydrostatic Bearings, and Materials and Lubrication. There will be given a total of 20 papers in these five Sessions.

This Joint Lubrication Conference will be open to all members of both ASME, ASLE, and guests. Those interested can get further information on this program by writing D. F. Wilcock, General Electric Co., General Engineering Laboratory, 1 River Road, Schenectady, N. Y., or the American Society of Lubrication Engineers, 84 E. Randolph St., Chicago 1, Ill.

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Deep Rock Expanding in In Mid-South

Deep Rock Oil Corporation has announced the signing of Southern Petroleum Co., Inc., of Memphis, Tenn., as its selling agent in a four state area comprising portions of Tennessee, Arkansas, Missouri and Mississippi.

The action signals an expansion of marketing operations on the part of both companies.

W. M. Murray, vice president of direct sales for Deep Rock, said the contract with Southern Petroleum marks Deep Rock's marketing debut in the jobber field in the Mid-South.

B. B. Hamilton, president of Southern Petroleum, one of the largest independent petroleum marketers in the Mid-South, said his company has launched an intensive campaign to sign independent jobbers throughout the assigned area as distributors of Deep Rock products.

While negotiations between Deep Rock and Southern Petroleum have been under way for some time, actual contract signing awaited construction of the new Oklahoma-Mississippi River products pipeline. The line, which runs from central Oklahoma to west Memphis, Ark., is now in the final stage of testing. Product is expected to start flowing through the line early in September.

Deep Rock will supply Southern Petroleum with gasolines, lubricating oils, kerosene, diesel fuels, heating oils, naphthas, solvents and other petroleum products.

Murray said the launching of Deep Rock's marketing operations in the Mid-South is part of a long-range plan that led to a recent expansion and modernization of the Deep Rock refinery at Cushing, Okla.

A \$2,500,000 solvent lubricating oil plant was completed by the company in 1953. Earlier, the blending and packaging plant was completely overhauled and modernized. Prior to that, Deep Rock constructed a \$4,000,000 catalytic cracking unit at the refinery for processing top quality gasolines. A modern research laboratory, staffed

with chemists, chemical engineers and mechanical engineers, also was added to refinery facilities.

Southern Petroleum, headed by Hamilton since its organization in 1941, distributes its products with a fleet of transport trucks operating out of Memphis. The company also has a substantial lubricating oil and grease business, serving numerous independent jobbers in the Mid-South. Its compounding plant at Memphis has approximately 25,000 square feet of floor space and has facilities that are capable of canning 3,000 cases of product a day. Automatic barreling and packing equipment is a feature of the plant.

Du Pont to Expand In California

The Du Pont Company has announced acquisition of options on land in California looking forward to the possibility of construction of a plant for the manufacture of tetraethyl lead and "Freon" refrigerants. The design work now under way will incorporate Du Pont's most recent technological developments in the manufacture of these products.

Tetraethyl lead is added to gasoline to prevent engine knocks. "Freon" is the gas which creates the cooling action in refrigerators and is the propellant for aerosol sprays.

Tetraethyl lead and "Freon" refrigerants are needed in increasing amounts to meet the requirements of the huge petroleum industry and the rapidly developing refrigeration and aerosol industries on the West Coast.

Acheson Opens Rochester Office

Acheson Colloids Company, Port Huron, Michigan, division of Acheson Industries, Inc., has announced the opening of a Rochester sales headquarters. Mr. E. A. Lampman, Service Engineer, is territorial sales supervisor for Western New York and Western Pennsylvania, and will be in charge.

Merit Award to Deep Rock

Deep Rock Oil Corporation has received the National Safety Council's Award of Merit for the 1953 safety performance of its refining and pipeline departments, R. M. Chesney, vice president of Manufacturing, announced recently.

Chesney received notification of the award from Ned Dearborn, Safety Council president, who said only 27 other companies in the United States qualified for a similar award. Twenty-five companies qualified for the Council's Award of Honor. These are the two highest awards given to industrial firms in the field of plant safety. A total of 930 organizations sought to qualify for them in 1953.

Deep Rock's refining division has now accumulated the total of 850,000 man-hours free of disabling accidents, extending back to June 1, 1953.

In addition to the award certificate, the Deep Rock refinery is authorized to fly the National Safety Council flag for the 1953 achievement.



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**Sinclair Central
District Sales to
New Office**

Sales offices of Sinclair Refining Company's Central District are now located in the new Sinclair Oil Building recently completed at 155 North Wacker Drive, Chicago, the company has announced.

The ten story building, in which Sinclair occupies six floors, is the first new building to be erected in the Loop district of Chicago since the 1930's. It is owned by the Suffolk Corporation, a subsidiary of John W. Galbreath Corp., and was built by the Turner Construction Company. It is fully air conditioned and has facilities for basement parking.

The new building serves as the general office for the five states of Sinclair's Central District and is also the home of the company's Auto Tour Service Bureau, which formerly was located on East Madison Street.

The sales offices of the Sinclair Metropolitan Chicago Area and the Illinois Area continue to be located at 2540 W. Cermak Road.

**Acheson Has
New Trademark**

Acheson Industries, Inc., an international holding and operating company, has introduced a new trademark as a common denominator for four affiliated manufacturing companies. The central figure of this trademark is a large hexagonalized "A" surrounded by an hexagonal border.

The trademark derives its hexagonal form from the shape of the graphite crystal and is significant because it pays tribute to the late Dr. Edward Goodrich Acheson, founder of the parent company. Dr. Acheson pioneered not only in the manufacture of electric furnace graphite, but also in the process for the manufacture of colloidal graphite.

The units of Acheson Industries which would derive mutual benefit from the use of this new symbolic trademark are: Acheson Colloids Company of Port Huron, Michigan; Acheson Colloids Limited of London,

England; Acheson Dispersed Pigments Co. of Philadelphia, Pennsylvania, and Gredag, Incorporated of Niagara Falls, New York. Although three of the companies bear the word "Acheson" in the corporate name, there is little about that fact which would lead the reader to conclude that there was a common interest.

In 1908 Acheson Industries, Inc., began as an up-state New York operation under the name of Acheson Oildag Company to manufacture dispersions of colloidal graphite in water and oil, sold under the trademarks "Aquadag" and "Oildag." This small firm, first located at Niagara Falls, was soon moved to Port Huron, Michigan, by Dr. Acheson, who found the water of Lake Huron purer for his early manufacturing processes.

Since 1910 operations have been carried out at Port Huron, where, under the name of Acheson Colloids Company, the original two products, "Aquadag" and "Oildag," have expanded into fifty "dag" brand dispersions of graphite and other solids for use in general and extreme temperature lubrication, mold coating and parting and forging compounds, impregnation, opaquing and electronic applications.

To open up a foreign market for Acheson products, a company, now known as Acheson Colloids Limited, was organized in London, England, in 1911. This British affiliate manufactures colloidal graphite similar to that of its American counterpart, as well as dispersions of carbon black and pigment in various media employed by the plastics industry.



New Acheson Trademark

NLGI SPOKESMAN

Another early undertaking to capitalize on the lubricating properties of electric furnace graphite was Gredag, Incorporated, founded in 1910 by the late Dr. Acheson to promote the sale of graphited greases.

Trademarks of these companies were similar, in that all used the suffix "dag," which was coined by Dr. Acheson from the words "deflocculated Acheson graphite." Over the years this trademark ending and the trademark "dag" itself has become intimately associated with dispensed graphite products, and it is being reserved today for that segment of the business.

When in 1952 Acheson Industries decided to expand into the dispersed pigments field, it acquired a printing ink plant in Philadelphia which also made dispersed pigments. The name was soon changed to Acheson Dispersed Pigments Co. as the demand for pigment dispersions soared. For a house mark this company adopted "adp," its initials, which now can be found on a variety of printing inks, as well as pigments and carbon blacks dispersed in thermoplastics and plasticizers. Acheson Colloids Limited has also adopted the "adp" brand for its line of pigment dispersions.

Thus it was that a variety of trademarks for different Acheson products came into being. It was this very multiplicity that led Acheson management to the design of a symbol that would lead industry to recognize these various enterprises as part of a whole.

ASLE Annual Meeting To Hold 21 Sessions

The 10th Annual Meeting and Lubrication Exhibit of the American Society of Lubricating Engineers, will be held in Chicago, Illinois, at the Hotel Sherman, April 13, 14 and 15, 1955.

Forty-one papers have already been tentatively scheduled in 16 sessions. Five of these sessions will be devoted exclusively to a special short course in Lubrication Engineering during the meeting.

One of the highlights on the Program will be a Panel on Industrial Hygiene and Material Hazards, which

will discuss dermatitis and its prevention. The Panel will be staffed by internationally known medical experts in the field of dermatology, and lubrication engineers responsible for maintenance in two major United States industrial plants.

Another Panel will cover "Controls for Extending the Useful Life of Coolants while in Use."

Two Symposia will be held during the meeting. The first will be a Symposium on "Fundamentals of Wear," which will be held in two sections, and will cover the latest theories and developments in this important research field. The second will cover Plant Safety as related to Lubrication, and discussion will be on Non-Flammable Hydraulic Fluids; Advantages of Centralized Lubrication; Proper Dispensing Equipment, and Safeguards against injury and fire.

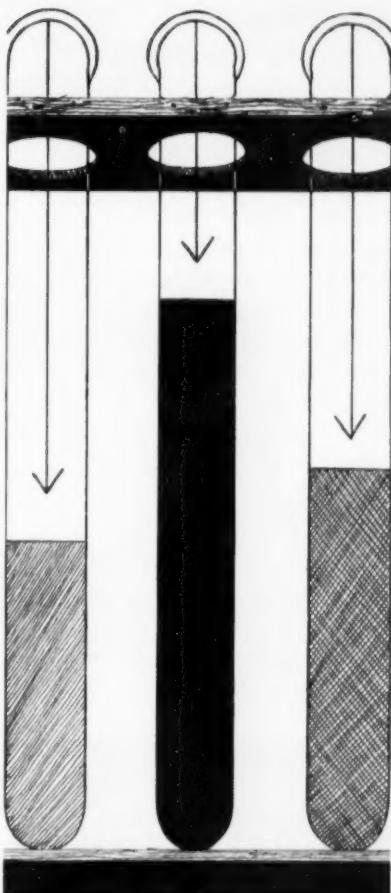
Other sessions will be devoted to: Film Type Bearings; Properties of Lubricants; Present Thinking in Gear Lubrication; Lubricant Dispensing; Equipment and Application; Rolling Contact Bearings; Organization of a Plant Lubrication Program; Metal Working Fluids; Lubricating Greases; Hydraulics.

The Lubrication Exhibit, which will be held in conjunction with the 10th Annual Meeting, will be the largest ever held in the history of the Society. ASLE members and guests will be able to examine the many devices and materials used in this essential field.

Before the average American car is scrapped, it will have consumed 8,000 gallons of gasoline and run up \$588 in gasoline taxes.

Approximately 1,000,000 miles of America's local roads, or 40 per cent of the total mileage, are used by less than ten vehicles daily.

The first successful pipeline, built in 1865, was two inches in diameter and five miles long. The biggest crude oil line today is 30 inches in diameter, large enough for a man to crawl through.



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Mobil Producing Company Incorporates

The incorporation of Mobil Producing Company, a wholly owned subsidiary of Socony-Vacuum Oil Company, Inc., has been announced. The new company will take over the operations formerly handled by the Pegasus Division of Socony-Vacuum.

Mobil Producing Company will conduct exploration and producing operations in the U. S. portion of the Williston Basin and in the northern Rocky Mountain area. The establishment of the new corporation is the culmination of plans initiated in January 1953, when the Pegasus Division of Socony-Vacuum was organized.

W. W. Clawson, formerly manager of the Pegasus Division, was elected president of Mobil Producing Company at the first meeting of the

new company's board of directors. Mr. Clawson will also remain president of Socony-Vacuum Oil Co. of Canada, Ltd. A. F. Barrett was elected vice-president and manager of production of the new company and John T. Rouse, vice-president and manager of exploration. Both men have been associated with the Pegasus Division in Billings, Montana, since its establishment. Headquarters for Mobil Producing Company will remain in Billings, where the company is now constructing a new office building.

Socony Fellowship To Missourian

The Socony-Vacuum Fellowship in Yale for the coming academic year has been awarded to Daniel J. McCaustland, a graduate student from Kansas City, Missouri, it has been announced by John G. Kirkwood, Director of Yale's Sterling Chemistry Laboratory.

Established a number of years ago, the Socony-Vacuum Fellowship in Yale is awarded annually to a student working in the field of chemistry for a doctoral degree. The fellowship carries a stipend of \$2,500 a year and is in line with an increasing trend by business and industry to support higher education in this country.

McCaustland, son of Mr. and Mrs. G. G. McCaustland, of 7321 Terrace Street, Kansas City, Missouri, received his B.A. degree from Kenyon College.

He is studying organic chemistry in the Yale Graduate School under Harry H. Wasserman, Assistant Professor of Chemistry, his faculty advisor.

Going over the \$2 billion mark for the first time, gasoline and other automotive taxes collected in 1952 by the federal government totaled \$2,100,066,269.

Constitutional amendments earmarking gasoline taxes and motor vehicle registration fees for highway purposes have now been adopted in 24 states.

Gulf Develops New Muskeg Tractor

A new vehicle designed for a new frontier, the muskeg tractor, will double or possibly triple the speed with which the vast muskeg regions of northern Canada can be explored for oil, Gulf Oil Corporation has announced.

It will do this by making possible full-scale summer prospecting operations in the muskeg regions; and also by expediting winter operations there.

The new all-track was designed and built to meet the oil company's specifications by Bombardier Snowmobile, Ltd., of Valcourt, Quebec, builder of specialty vehicles for snowbound and difficult terrain.

Muskeg is a moss which has grown over the surface of glacial lakes, producing "a water-soaked layer of moss and dead trees of unpredictable thickness," as one prospector describes it. This boggy land extends over roughly

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a third of the northern Alberta area where company crews are working.

In winter, the muskeg freezes to an unpredictable depth with treacherous thin spots here and there. In summer, it forms a crusty matting, often deceptively dry, which may break through anytime—without warning—under the weight of a vehicle or a man.

It wears through quickly if used as a trail. Many vehicles have been inextricably mired or disappeared altogether in it.

As a result only the wintertime, when temperatures range from 20° to 60° below zero, has been feasible for extensive operations in this terrain. Camps must be established, trails bulldozed, supplies brought in during the cold months when the frozen muskeg offers a more or less usable surface.

Summer cuts off all access to such regions except by air. Light planes especially equipped for bush operations service this country. Much of

the time of crews living in isolated camps is spent in struggling to progress a few miles and pulling vehicles out of the muck.

For these difficult conditions, the rugged muskeg tractor provides a satisfactory answer. The tractor, with its two tandem wheel tracks 29 inches wide and presenting approximately 5,000 sq. inches of surface to the ground, can penetrate where even men could not walk without sinking.

While not designed as a flotation vehicle because of the terrain conditions it must traverse—consisting principally of hills, timberland and brush—the new tractor can venture on thinner-surfaced, more treacherous terrain than possible for any other land vehicle tried by the company to date.

The tractor speeds up summer operations by two to three times over the previous rate, the company states on the basis of a half year's experience. Because vehicles are sometimes lost in winter through thinly frozen surfaces, the muskeg vehicle increases the ef-

ficiency of winter prospecting also.

Two years ago engineers and geophysicists of the research laboratories went to Canada to study a means of motor transport to get summer prospecting out of the paralyzing grip of the muskeg. They investigated use of weasels, half-tracks, tractors, snowmobiles, bulldozers, jeeps, and make-shift combinations.

The weasels (Army surplus equipment no longer available) performed best. But all got stuck at times. As a result the engineers laid down these specifications for a new muskeg vehicle:

It must be an all-track. Pressure per square inch of tread should not exceed 1½ lbs. (a jeep exerts 50 to 100 lbs. and a man five to six lbs. per square inch). It must carry a 2,500 lb. load besides its own weight of about 5,000 lbs. Dimensions must not exceed seven ft. wide by 12 ft. long for ease in transport to the muskeg and negotiating timber trails.

The chassis has many interesting



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features. Its Chrysler Industrial 116 h.p. motor is mounted amidships, delivering power through a four-speed synchro-mesh transmission. There is no steering wheel—steering being effected by a controlled differential transmission actuated by two levers, the one applying more power on the left hand drive and the other on the right.

The cab is also equipped with clutch pedal, accelerator pedal, and gear shift levers.

Power is transmitted through double sprockets on each side to tractor treads of forged steel grousers (or cross pieces), which run on double tandem wheels, two pairs in front and two in back—16 wheels in all.

Front and rear tandem are hung on bogie axles producing maximum flexibility in passing over high objects. Super-rugged nylon cord tires, costing two to three times regular tires, are used to withstand the rough service.

Preliminary design studies on bodies and equipment were made at the research laboratories; and final design and field installation was completed under direction of Field Supervisor Harry Carlyle at Edmonton, with the assistance and cooperation of Northwest Industries, Industrial Engineers, Ltd., Seismic Service Supply, and Mayhew Machine and Supply Co. This, too, proved a pioneering job.

Because of the comparatively small size of the tractors and the light load required, all equipment had to be scaled down and lightened as compared to use in the States.

Four bodies were designed: a seismic instrument unit; water unit (to supply drilling and camp water); drilling unit; and general utility and supply unit. The ingenuity of design permitted these vehicles to carry the scaled-down essentials that seven larger trucks would carry in seismic prospecting normally.

For instance, the drill mounted on the drill unit weighs about one-fourth of that in use in the States. Instruments, cables, and cable reels are comparatively reduced in size.

Among other special equipment were power-operated winches permitting the tractor to pull itself or another vehicle out from either direction; safety-glass windshield to prevent breakage when struck by timber; and radiator fan shrouds to prevent overheating.

Alemite Announces Publication

Just published by the Alemite division of Stewart-Warner Corporation and available to anyone in industry, is a thirty-two page catalog of "Versatal" materials handling equipment.

The aptness of the trade-name, "Versatal," of Alemite's materials pumping line is illustrated in the first few pages of this combined catalog and selection manual.

Examples of the handling of all types of materials are illustrated with forty-two pictures.

A section of the book which will be of particular utility to maintenance and production men, purchasing agents or others who, although broadly familiar with the advantages of this type of materials handling are stumped by the prospect of ordering out the proper combination of pumps, hoses, control valves and other elements to obtain the most efficient and economical system are the eight pages devoted to integrated "packages." In each case, determined by type of material to be handled and size of container, a bill of materials giving model numbers of components and such supplementary information as hose ratios, hose lengths and other pertinent data, is provided.

A section on accessories includes data on follower-plates, powered agitators to prevent separation of mate-

rials in the container, spray guns and poles, pressure regulators, hose connectors, air consumption rates and compressors and other operational requirements.

Information concerning testing of materials to determine whether they can be handled efficiently with Versatal pumps is also included. Details of operations of the testing laboratories, at which manufacturers and users of materials may obtain actual working conditions testing of materials without cost, are explained. Such service is available through the nation-wide Alemite distributor organization, listed city by city on the back cover.

Continental Announces Scholarship Winners

Three high school graduates in Pennsylvania, Tennessee and Washington are winners of the 1954 Carle C. Conway scholarships, awarded annually by Continental Can Company to children of company employees.

Four-year, \$1,000 annual scholarships, according to General Lucius D. Clay, chairman of the board, have been won by Barbara M. Rossi, of Pittsburgh, Pa.; Nancy E. Wilson, Memphis, Tenn., and Patricia A. Shaughnessy, of Seattle, Wash.

Winners were selected on the basis of their high school scholastic records and results of college entrance examinations as well as on qualities of character and leadership.

In addition, two special \$500 annual scholarships have been awarded to M. Ruth Shellhorn, of Seattle, and Helen V. Andres, of Campbell, Calif.

Named after the former Continental president and board chairman, the scholarships are given alternately, each year, to daughters and sons of company employees. This marks the fourth year that the awards have been made.

FUTURE MEETINGS of the Industry

SEPTEMBER, 1954

12-14 Empire State Petroleum Assn., Hotel Syracuse, Syracuse, N.Y.

12-16 Society of Automotive Engineers (national tractor meeting), Schroeder Hotel, Milwaukee, Wis.

12-16 American Inst. of Chemical Engineers, Colorado Hotel, Glenwood Springs, Colo.

12-17 American Chemical Society, New York, N.Y.

13-14 Packaging Institute (petroleum packaging committee), Philadelphia, Pa.

15-17 National Petroleum Assn. (52nd annual meeting), Traymore Hotel, Atlantic City, N.J.

15-17 American Petroleum Institute Lubrication Committee, Traymore Hotel, Atlantic City, N.J.

16-17 Mid-Continent Oil and Gas Assn. (annual meeting), Roosevelt Hotel, New Orleans, La.

22-23 Ohio Petroleum Marketers Association (fall conference and golf tournament), Hollenden Hotel and Westwood Country Club, Cleveland, Ohio.

23-24 Western Petroleum Refiners Assn. (regional meeting), Henning Hotel, Casper, Wyo.

26-28 Pennsylvania Petroleum Assn., Inc., Pocono Manor Inn, Pocono Manor, Penna.

27-28 Independent Oil Compounders Association (7th annual meeting), Sheraton Hotel, Chicago, Illinois.

OCTOBER, 1954

3-7 ASTM Committee D-2 on Petroleum Products and Lubricants, Sheraton Park Hotel, Washington, D.C.

4-6 Texas Mid-Continent Oil and Gas Assn. (annual meeting), San Antonio, Texas.

4-6 Petroleum Electric Power Association (26th anniversary meeting), Jung Hotel, New Orleans, La.

4-9 Society of Automotive Engineers (national aeronautic meeting), aircraft engineering display, and aircraft production forum, Hotel Statler, Los Angeles, Calif.

7-8 American Institute of Mining and Metallurgical Engineers (Pacific Petroleum Chapter), Biltmore Hotel, Los Angeles, Calif.

10-12 National Assn. of Oil Equipment Jobbers (4th annual meeting), Congress Hotel, Chicago, Ill.

10-12 Empire State Petroleum Association, Whiteface Inn., Whiteface, N.Y.

12-15 National Chemical Exposition (8th meeting), Coliseum, Chicago, Ill.

13-15 National Industrial Conference Board (annual meeting on atomic energy), Hotel Commodore, New York, N.Y.

17-20 American Institute of Mining and Metallurgical Engineers (fall meeting, petroleum division), Plaza Hotel, San Antonio, Texas.

Week of Oct. 18 Society of Automotive Engineers (national transportation meeting), Boston, Mass.

20-21 Nebraska Petroleum Marketers Assn. (annual convention), Paxton Hotel, Omaha, Neb.

21-22 Western Petroleum Refiners Assn. (Garrett Hotel), El Dorado, Ark.

24-26 Independent Petroleum Association of America, Mayo Hotel, Tulsa, Okla.

25-27 NLGI ANNUAL MEETING, MARK HOPKINS HOTEL, SAN FRANCISCO, CALIF.

25-29 American Institute of Electrical Engineers (fall general meeting), Chicago, Ill.

26-27 Society of Automotive Engineers, national diesel engine meeting, Hotel Statler, Cleveland, Ohio.

27-29 American Institute of Electrical Engineers (Conference for Petroleum Industry), Mayo Hotel, Tulsa, Okla.

27-30 American Society of Mechanical Engineers (annual engineering conference), Statler Hotel, Los Angeles, Calif.

28-29 American Petroleum Institute (Executive Committee of the Board of Directors), The Greenbrier, White Sulphur Springs, W. Va.

NOVEMBER, 1954

4-5 Society of Automotive Engineers (national fuels and lubricants meeting), Mayo Hotel, Tulsa, Okla.

8-11 American Petroleum Institute (34th annual meeting), Conrad Hilton Hotel and Palmer House, Chicago, Ill.

15-17 American Petroleum Credit Association (annual conference), Muehlebach Hotel, Kansas City, Mo.

15-17 American Standards Association (annual meeting), Roosevelt Hotel, New York, N.Y.

15-17 National Conference on Standards (5th conference), Roosevelt Hotel, New York, N.Y.

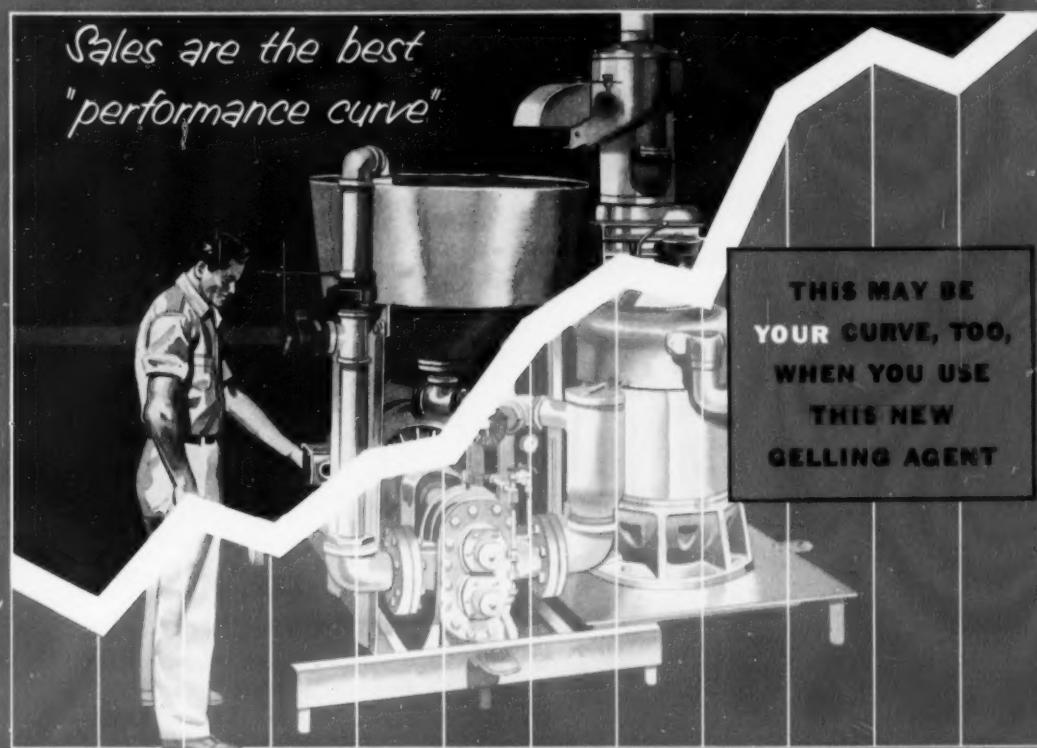
28 to American Socy. of Mechanical Dec. 3 Engineers, Statler Hotel, New York, N.Y.

29-30 Packaging Institute (Petroleum Packaging Committee), New York, N.Y.

DECEMBER, 1954

2-7 National Exposition of Power and Mechanical Engineering, Commercial Museum, Philadelphia, Penna.

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"performance curve"*



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WHEN YOU USE
THIS NEW
GELLING AGENT

ACTUAL SALES OF BENTONE* 34, BY WEIGHT, 1951-1954

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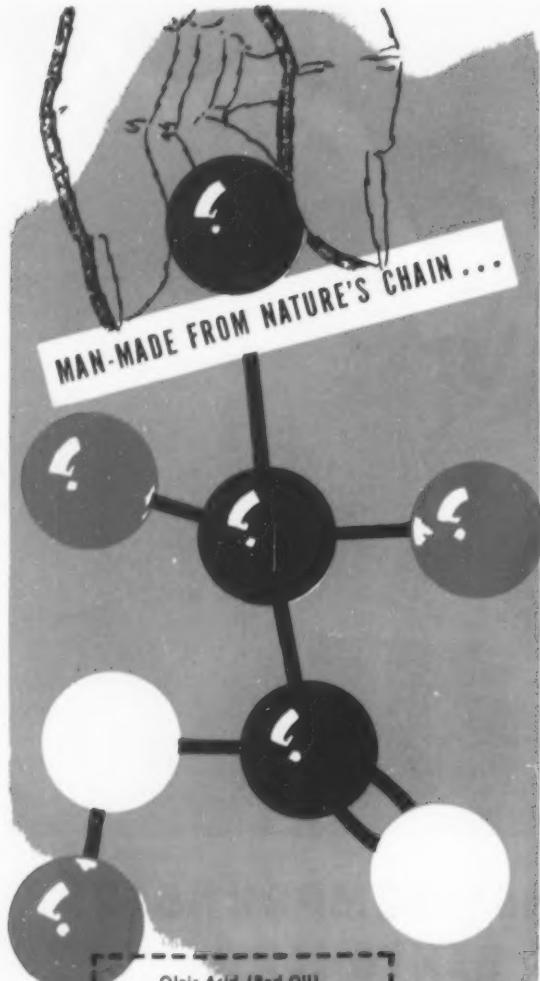
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3-4 Interstate Oil Compact Commission, Drake Hotel, Chicago, Ill.

5-8 American Society of Agricultural Engineers (winter meeting), Edgewater Beach Hotel, Chicago, Ill.

8-10 Oil Industry Information Committee, Waldorf-Astoria, New York, N. Y.

12-15 American Inst. of Chemical Engineers (annual meeting), Statler Hotel, New York, N. Y.

27-30 American Association for the Advancement of Science, University of California, Berkeley, Calif.

JANUARY, 1955

10-14 Society of Automotive Engineers (golden anniversary annual meeting), The Sheraton-Cadillac Hotel and Hotel Statler, Detroit, Michigan

FEBRUARY, 1955

13-18 ASTM Committee D-2 on Petroleum Products and Lubricants, Rice Hotel, Houston, Texas.

MARCH, 1955

15-17 Ohio Petroleum Marketers Association (spring convention and trade exposition), Deshler-Hilton Hotel, Columbus, Ohio.

APRIL, 1955

13-15 American Society of Lubrication Engineers (tenth annual meeting and lubrication exhibit), Hotel Sherman, Chicago, Illinois.

MAY, 1955

23-25 American Petroleum Institute (Division of Marketing, mid-year meeting), Chase and Park Plaza Hotels, St. Louis, Mo.

JUNE, 1955

6-15 Fourth World Petroleum Congress, Rome, Italy.

NOVEMBER, 1955

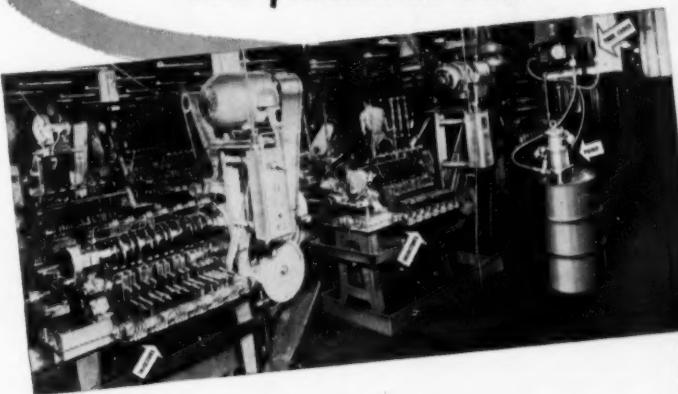
14-17 American Petroleum Institute (35th annual meeting), San Francisco, Calif.

OCTOBER, 1955

23-25 National Assn. of Oil Equipment Jobbers (4th annual meeting), Hotel President, Kansas City, Mo.

SEPTEMBER, 1954

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systems combine to insure top
machine output at lowest
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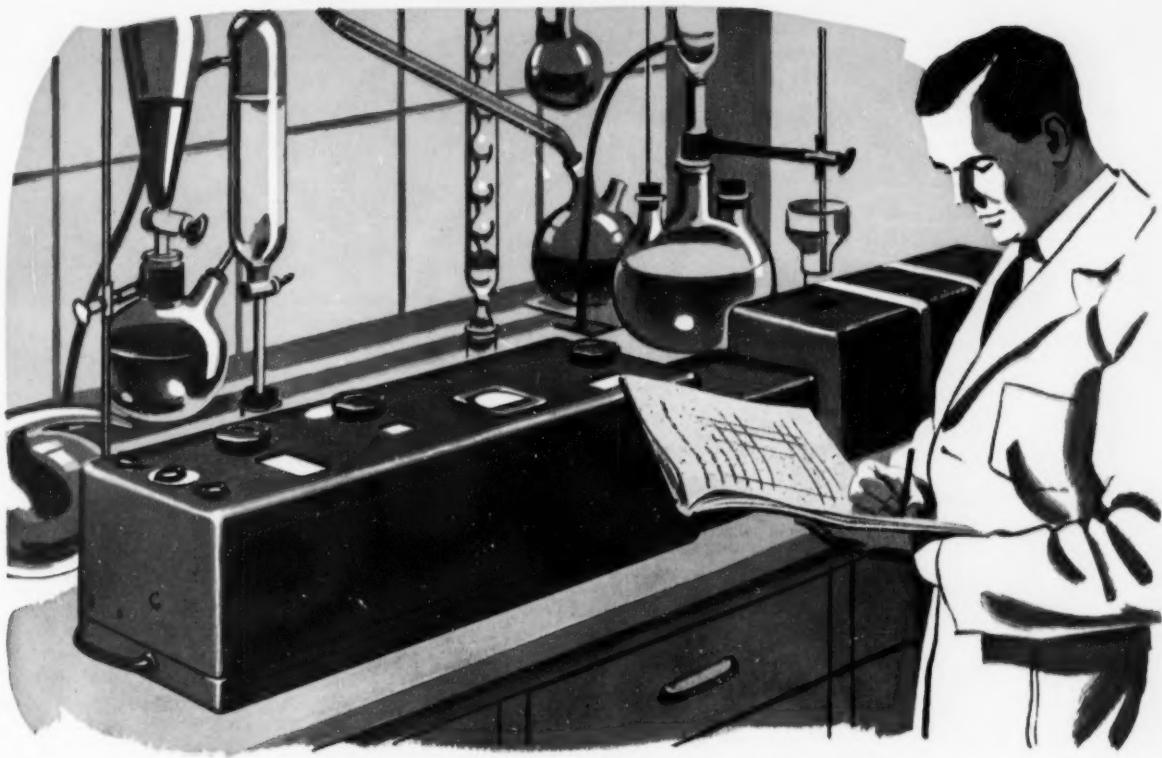
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And the development of the wheel brought about the problem of lubrication. Historically, lubricants are believed to have been in use over 7000 years.

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With these developments came ever-increasing demands for higher quality, better uniformity, and greater homogeneity. Morehouse engineers . . . looking for a solution . . . followed the same development pattern. They developed high-speed stone milling to a high degree of perfection. The stones . . . operating in a horizontal plane in the Morehouse Mills . . . went faster and faster, reaching their present high-production speed of 5400 R.P.M. And, turning back to friction to make it the servant and not the master, Morehouse engineers collaborated with The Carborundum Company to develop specific stones for specific products. Finally, Morehouse added accurate adjustment of stone separation . . . in 1/1000's of an inch up to 1/8 inch . . . to obtain the exact degree of homogenization, emulsification, disintegration, dispersion, blending, or grinding desired for each particular lubrication product.

A closely allied problem, deaeration, was met head on and solved. Today you benefit from the combined Morehouse milling and deaeration equipment. It is portable and easy to move about. It gives you the answer to many of your today's problems . . . higher quality, better uniformity, greater homogeneity.

Thus the turning wheels have evolved the turning stones . . . the stones in Morehouse Mills. May we help you?

LOOK FOR THIS PENNANT ON GREASE PROCESSING EQUIPMENT . . . IT IS YOUR INDICATION OF LEADERSHIP

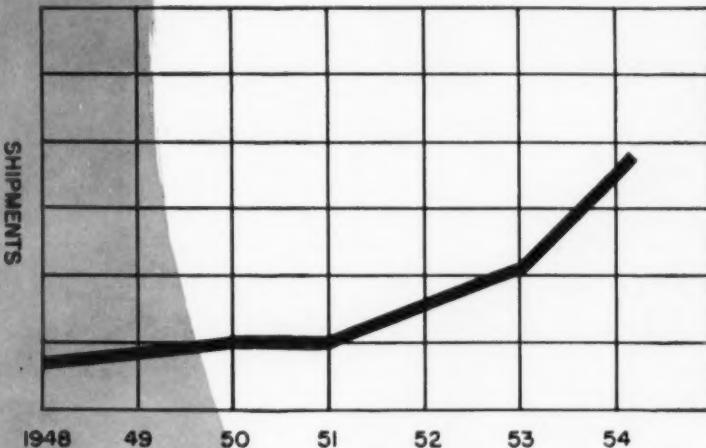
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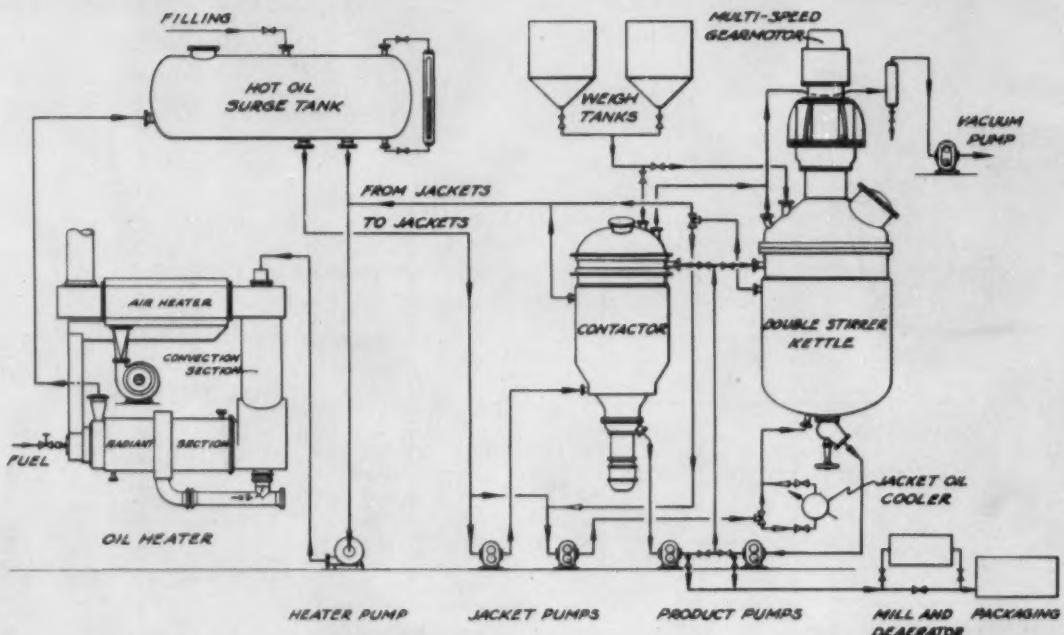
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